Local Government Energy Audit:
Energy Audit Report

Charles H. Bullock School

55 Washington Street

Montclair, New Jersey 07042

Montclair Board of Education

January 3, 2019

Final Report by:

TRC Energy Services

Disclaimer

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

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

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

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

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1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Charles H. Bullock School.

The goal of a LGEA is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and put you in a position to implement the ECMs. The LGEA also sets you on the path to receive financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing the ECMs.

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey local government in controlling energy costs and protecting our environment by offering a full spectrum of energy management options.

1.1 Facility Summary

Charles H. Bullock School is an 84,017 square foot facility constructed in 2010. The building is a two-story educational facility including but not limited to classrooms, library areas, offices, hallways and conference areas.

Lighting at the facility consists mainly of 32-Watt T8 fluorescent fixtures and 28-Watt T5 linear fluorescent fixtures; all of which are inefficient in performance when compared to the latest lighting technology available in the market. In addition to linear fluorescent technology, the facility also has several incandescent, and compact fluorescent lamps. Exterior lighting is provided by a combination of 250-Watt metal halide fixtures, 28-Watt and 14-Watt T5 linear fluorescent fixtures, and 26-Watt compact fluorescent lamps. Interior lighting control is provided by a combination of manual switches and occupancy sensors.

Cooling and ventilation are provided by a combination of package units and water source heat pumps. Heating is provided by a gas furnace and non-condensing hot water boilers.

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

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

Natural gas billing data was not available when the analysis for this report was done. In addition, the electricity production from the sites solar panels was not available. Therefore, the calculated energy use was checked against typical values for schools located in the same geographical area.

TRC evaluated five projects which represent an opportunity for Charles H. Bullock School to reduce annual energy costs by approximately $20,436 and annual greenhouse gas emissions by 138,873 lbs CO_2e. The measures would pay for themselves in 8.67 years. Figures 1 and 2 present the cost of electricity purchased from PSE&G before and after the measures are implemented. These projects represent an opportunity to reduce Charles H. Bullock School's annual energy use by approximately 11%.

Figure 1 – Previous 12 Month Electricity Costs

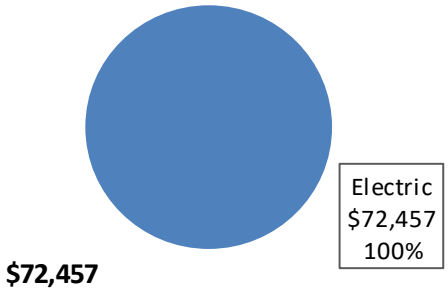
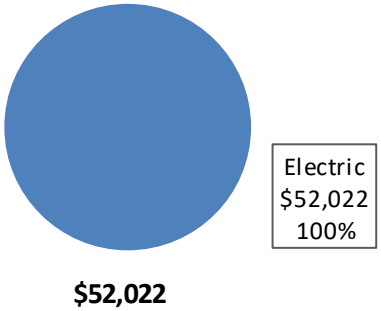


Figure 2 – Potential Post-Implementation Electricity Costs



A description of Charles H. Bullock School's existing energy use can be found in Section 3.

The evaluated measures have been listed and grouped into major categories as shown in Figure 3. Brief descriptions of the categories can be found below and descriptions of the individual opportunities can be found in Section 4.

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**122,972**	**63.9**	**0.0**	**$18,222.21**	**$174,653.75**	**$19,125.00**	**$155,528.75**	**8.54**	**123,832**
ECM 1	Install LED Fixtures	Yes	44,072	37.8	0.0	$6,530.68	$87,588.98	$5,720.00	$81,868.98	12.54	44,380
ECM 2	Retrofit Fixtures with LED Lamps	Yes	78,900	26.0	0.0	$11,691.53	$87,064.77	$13,405.00	$73,659.77	6.30	79,451
Lighting Control Measures			**13,325**	**4.1**	**0.0**	**$1,974.54**	**$21,714.00**	**$1,435.00**	**$20,279.00**	**10.27**	**13,418**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	8,310	2.6	0.0	$1,231.36	$11,114.00	$1,435.00	$9,679.00	7.86	8,368
ECM 4	Install High/Low Lighitng Controls	Yes	5,015	1.5	0.0	$743.18	$10,600.00	$0.00	$10,600.00	14.26	5,050
Plug Load Equipment Control - Vending Machine			**1,612**	**0.0**	**0.0**	**$238.85**	**$1,437.60**	**$0.00**	**$1,437.60**	**6.02**	**1,623**
ECM 5	Vending Machine Control	Yes	1,612	0.0	0.0	$238.85	$1,437.60	$0.00	$1,437.60	6.02	1,623
TOTALS			**137,909**	**68.0**	**0.0**	**$20,435.60**	**$197,805.35**	**$20,560.00**	**$177,245.35**	**8.67**	**138,873**

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

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

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

Lighting Controls measures generally involve the installation of automated controls to turn off lights or reduce light output when conditions allow. Automated control reduces reliance on occupant behavior for adjusting lights. These measures save energy by reducing the amount of time lights are on.

Plug Load Equipment control measures generally involve installing automation that limits the power use or operation of equipment plugged into an electrical receptacle based on occupancy.

Energy Efficient Practices

TRC also identified 11 low cost (or no) cost energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral and operational adjustments as well as performing routine maintenance on building systems. Through these practices equipment lifetime can be extended; occupant comfort, health and safety can be improved; and annual energy, operation, and maintenance costs can be reduced. Opportunities identified at Charles H. Bullock School include:

- Reduce Air Leakage
- Close Doors and Windows
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Perform Routine Motor Maintenance
- 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 practices, please refer to Section 5.

Self-Generation Measures

TRC evaluated the potential for installing self-generation sources for Charles H. Bullock School. Based on the configuration of the site and its loads there is a low potential for installing additional PV or combined heat and power self-generation measures.

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

1.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, the equipment changes outlined for each ECM need to be selected and installed through project implementation. One of the first considerations is if there is capital available for project implementation. Another consideration is whether to pursue individual ECMs, a group of ECMs, or a comprehensive approach wherein all ECMs are pursued, potentially in conjunction with other facility projects or improvements.

Rebates, incentives, and financing are available from the NJBPU, NJCEP, as well as some of the state's investor-owned utilities, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any project, please review the appropriate incentive program guidelines before proceeding. This is important because in most cases you will need to submit an application for the incentives before purchasing materials and beginning installation.

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

- SmartStart
- Energy Savings Improvement Program (ESIP)

For facilities with capital available for implementation of selected individual measures or phasing 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 design the ECM(s), select the equipment and apply for the incentive(s). Program pre-approval is required for some SmartStart incentives, so only after receiving approval may the ECM(s) be installed. The incentive values listed above in Figure 3 represent the SmartStart program and will be explained further in Section 8, as well as the other programs as mentioned below.

For facilities without capital available 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 external project development, design, and implementation services as well as financing for implementing ECMs. This LGEA report is the first step for participating in ESIP and should help you determine next steps. Refer to Section 8.2 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a program (non-NJCEP) designed to reduce consumer electric load when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability locally. By enabling grid operators to call upon Curtailment Service Providers and energy consumers 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 will receive payments whether or not their facility is called upon to curtail their load. Refer to Section 7 for additional information on this program.

Additional descriptions of all relevant incentive programs are located in Section 8 or: www.njcleanenergy.com/ci.

To ensure projects are implemented such that maximum savings and incentives are achieved, bids and specifications should be reviewed by your procurement personnel and/or consultant(s) to ensure that selected equipment coincides with LGEA recommendations, as well as applicable incentive program guidelines and requirements.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 4 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Brian Fleischer	Business Administrator	bfleischer@montclair.k12.nj.us	(973) 509-4050
Designated Representative			
Robertz Eles	Head Custodian		(973) 809-2921 Ext.4582
TRC Energy Services			
Moussa Traore	Auditor	mtraore@trcsolutions.com	(732) 855-2879

2.2 General Site Information

On November 07, 2016, TRC performed an energy audit at Charles H. Bullock School located in Montclair, NewJersey. TRC's team met with Robertz Eles to review the facility operations and focus the investigation on specific energy-using systems.

Charles H. Bullock School is a 74,180 square foot facility constructed in 2010. The building is a two-story educational facility including but not limited to classrooms, library areas, offices, hallways and conference areas.

2.3 Building Occupancy

The typical schedule is presented in the table below.

Figure 5 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Charles H. Bullock School	Weekday	8:00 AM - 5:30 PM
Charles H. Bullock School	Weekend	unoccupied

2.4 Building Envelope

Charles. H. Bullock School is a two-story building. The construction is of concrete masonry block with brick exterior and double pane clear windows with fixed frames. The flat roof is constructed of built-up roofing material.

Figure 6 – Building Façade

2.5 On-site Generation

The school uses electricity produced from solar panels on-site in addition to utility purchased electricity. Since incomplete historical utility data was provided for the Charles H. Bullock school, calculated energy use was used as the baseline energy use for savings evaluations.

2.6 Energy-Using Systems

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

Lighting System

Lighting at the School consists mainly of 32-Watt T8 fluorescent fixtures and 28-Watt T5 linear fluorescent fixtures. These sources are inefficient in performance when compared to the latest lighting technology available in the market. The linear fluorescent fixtures are 2-foot and 4-foot long, mainly troffers with diffusers having 2, 3, or 4-lamp configurations. In addition to the fluorescent fixtures, the facility is also served by 13-Watt, 26-Watt, and 32-Watt compact fluorescent lamps, 75-Watt halogen incandescent lamps, and 575-Watt incandescent flood lamps used for stage lighting.

Interior lighting control in the building is provided by a combination of manual switches and occupancy sensors.

Figure 7 - Building Lighting Systems

Linear Fluorescent Fixture	*Exterior Fixture*
	

Exterior lighting is provided by a combination of 250-Watt metal halide fixtures, 26-Watt compact fluorescent lamps, and 14-Watt and 28-Watt T5 linear fluorescent fixtures.

Heating System

The hot water system consists of two Lochinvar 1,739 kBtu/hr output, non-condensing hot water boilers. The boilers have a nominal combustion efficiency of 84%. The hot water system has two 5 hp hot water circulation pumps that circulate hot water from boilers through the water source heat pump units.

The boilers are in good condition and appear to be well maintained.

Figure 8 – Heating Systems

Hot Water Boilers	*Hot Water Pumps*
	

Air Conditioning (DX)

There are approximately 77 water-source heat pump units (WSHPs) supplying heating, cooling, and ventilation to the facility. As needed, heat is added to the water loop by a boiler or removed with a cooling geothermal source. The WSHPs are constant air volume units with cooling capacities between 0.83 tons to 23 tons. All of the WSHPs use direct-expansion (DX) coils.

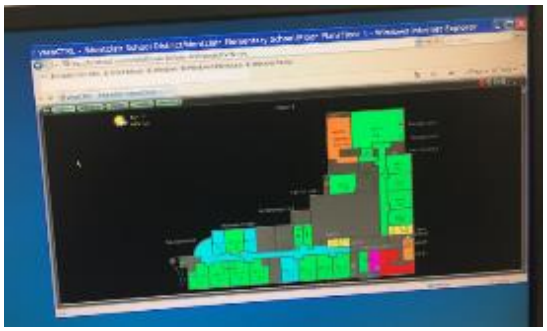
Figure 9 – Air Conditioning (DX) Systems

The facility also has a 5 ton Reznor direct-expansion (DX) package unit with a gas fired furnace. The unit provides constant air volume. The unit utilize a scroll compressor and a DX coil. The gas fired furnace provides heating as needed.

Building Energy Management System

The majority of the facility is controlled with an Automated Logic Corporation's WebCtrl building energy management system (BEMS). The BEMS aggregates the DDC points from throughout the building. The system is capable of providing advanced controls and trends for individual HVAC system.

Figure 10 – Building Energy Management System (BEMS)

Energy Management System (EMS)	*EMS Controller*
	

Domestic Hot Water

The domestic hot water system for the facility consists of one A.O. Smith gas fired domestic hot water heaters with an input rating of 399 kBtu/hr and a nominal efficiency of 84%. The water heater has a 200 gallon storage tank.

Figure 11 – DHW System

Food Service

The facility has several food service equipment including full sized gas convection oven, gas combination/steam cooker, insulated food holding cabinet, and a gas fryer. All equipment was shown to be in good condition and well maintained.

Figure 12 – Steam Cooker and Gas burners

Refrigeration

The facility has five stand up refrigerators with solid door, one low-temperature freezer, one medium temperature freezer, and one ice making head producing around 450 pounds of ice per day.

Figure 13 – Refrigeration Systems

Stand-up Refrigerator	*Ice Maker*
	

Plug load & Vending Machines

The facility contains several systems which contribute to plug load electric use including but not limited to desktop computers, printers, microwaves, and copiers. In addition to the typical plug load equipment, the facility also has one refrigerated and non-refrigerated vending machines.

3 SITE ENERGY USE AND COSTS

Historical utility data was only provided for purchased electricity. The school also uses electricity produced from solar panels on-site. PSE&G also delivers natural gas to the school. Since incomplete historical utility data was provided for the Charles H. Bullock School, the calculated energy use was used as the baseline energy use for savings evaluations. The calculated energy use was compared to the energy use of a typical school in this geographical area as a reasonableness check.

There are a number of factors that could cause the energy use of this building to vary from the "typical" energy use for other schools. Specific local climate conditions, daily occupancy hours of the facility, seasonal fluctuations in occupancy, daily operating hours of energy use systems, and the behavior of the occupants with regard to operating systems that impact energy use such as turning off appliances and leaving windows open.

3.1 Total Cost of Energy

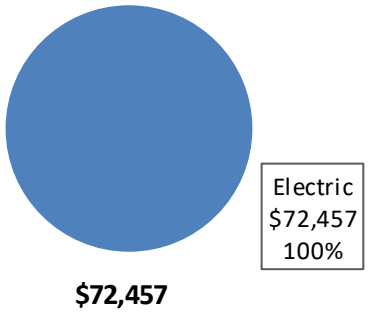
The following energy consumption and cost data is based on the last 12 month period of utility usage data that was provided for each utility.

Figure 14 - Utility Summary

Utility Summary for Charles H. Bullock School		
Fuel	**Usage**	**Cost**
Electricity	488,976 kWh	$72,457
Total		**$72,457**

The current electricity cost for this site is $72,457 as shown in the chart below.

Figure 15 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by the South Jersey Energy Company and transmission is provided by PSE&G. The average electric cost (combined for commodity, transmission and distribution) for the past 12 months is $0.148/kWh, which is the blended rate used throughout the analyses in this report. The Charles H. Bullock school also generates electricity with solar panels. The analysis assumes that the savings will come from the utility supplied electricity.

Only records of purchased electricity were provided by the school district. The graph below represents the monthly electricity purchases and does not include any electricity generated on-site.

Figure 16 - Purchased Electric Usage & Demand

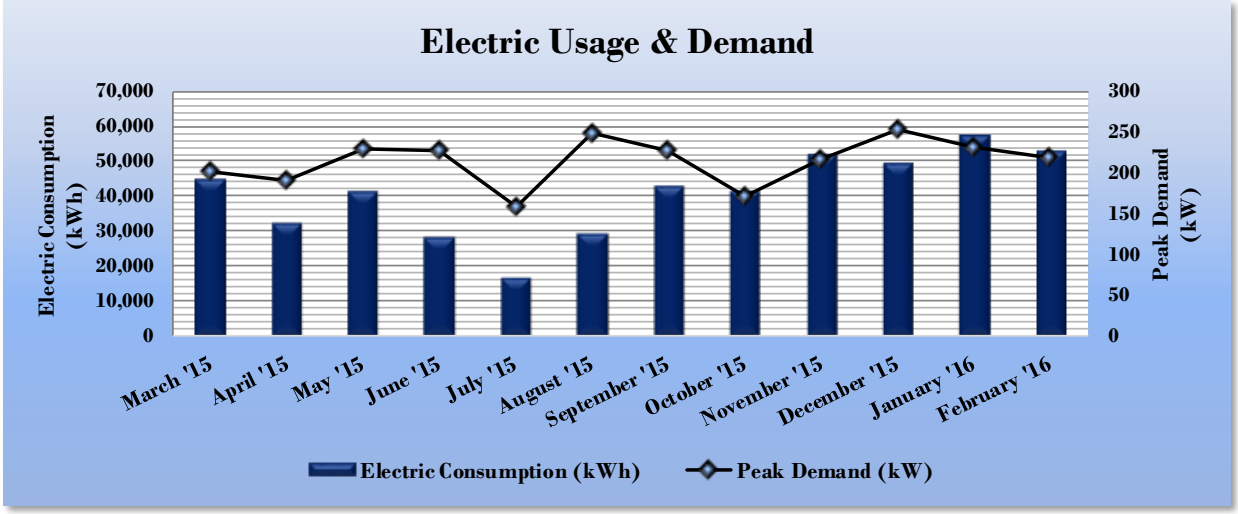


Figure 17 - Electric Usage & Demand

Electric Billing Data for Charles H. Bullock School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
4/15/15	30	44,810	201		$6,352
5/14/15	29	32,242	191		$4,757
6/15/15	32	41,531	230		$7,410
7/15/15	30	28,492	228		$5,777
8/13/15	29	17,008	159		$3,002
9/14/15	32	29,157	248		$5,784
10/13/15	29	42,903	228		$5,912
11/11/15	29	41,309	171		$5,716
12/14/15	33	51,946	215		$6,946
1/14/16	31	49,325	254		$6,710
2/12/16	29	57,470	231		$7,453
3/15/16	32	52,783	218		$6,639
Totals	**365**	**488,976**	**253.9**	**$0**	**$72,457**
Annual	**365**	**488,976**	**253.9**	**$0**	**$72,457**

3.3 Benchmarking

Since complete historical utility data was not provided this facility could not be benchmarked through 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 compares its performance against a yearly baseline, national medians, or similar buildings in your portfolio. Metrics used in this comparison are the energy use intensity (EUI) and ENERGY STAR® score.

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 energy than similar buildings on a square foot basis or if that building performs better than the median. EUI is presented in both 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 is the raw fuel consumed to generate the energy consumed at the site, factoring in energy production and distribution losses.

Figure 18 - Energy Use Intensity Comparison – Calculated Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Charles H. Bullock School	National Median Building Type: School (K-12)
Site Energy Use Intensity (kBtu/ft²)	50.8	58.2

By implementing all recommended measures covered in this reporting, the project's estimated post-implementation EUI improves as shown in the table below:

Figure 19 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

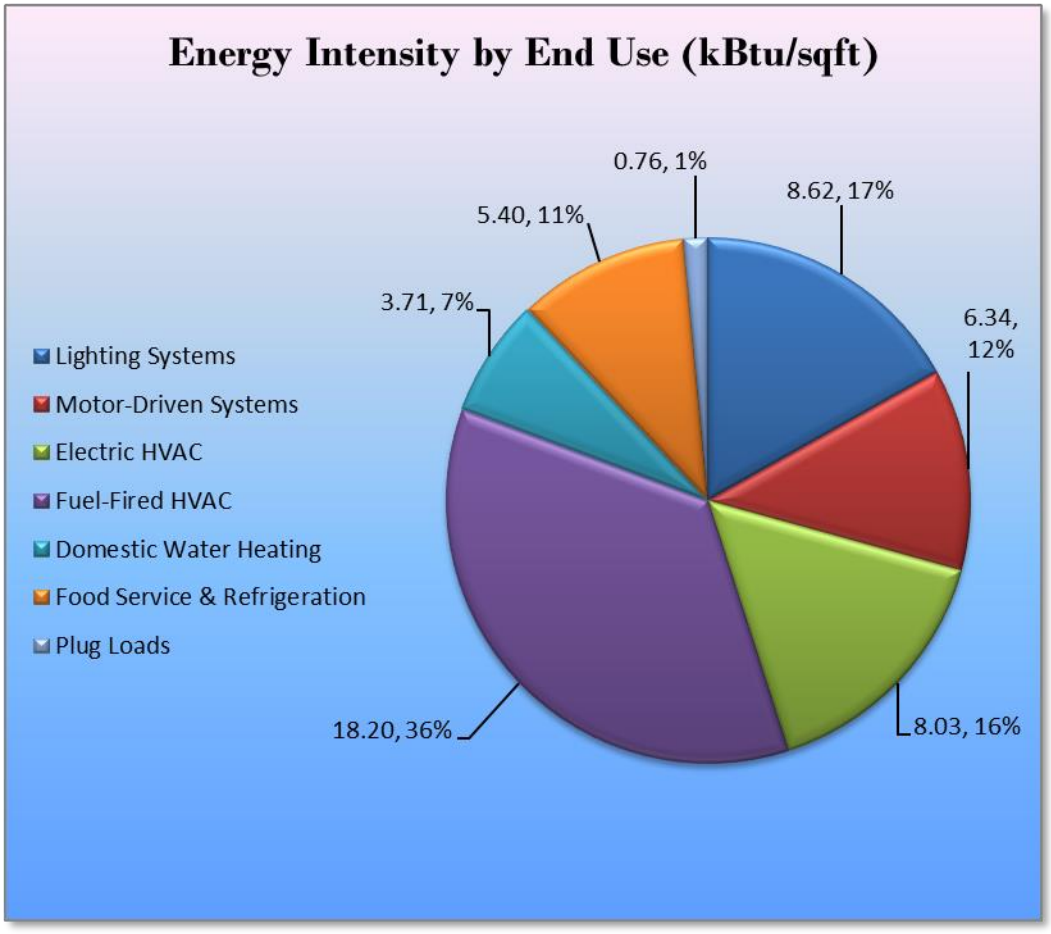
Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Charles H. Bullock School	National Median Building Type: School (K-12)
Site Energy Use Intensity (kBtu/ft²)	45.2	58.2

Many buildings can also receive a 1 – 100 ENERGY STAR® score. This score 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.

3.4 Energy End-Use Breakdown

In order to provide a complete overview of energy consumption across building systems, an energy balance was performed at this facility. An energy balance utilizes standard practice engineering methods to evaluate all components of the various electric and fuel-fired systems found in a building and determine their proportional contribution to overall building energy usage. This visual representation of energy end uses highlights systems that may benefit most from energy efficiency projects.

Figure 20 - Energy Balance (% and kBtu/SF)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy projects, help prioritize specific measures for implementation, and set Charles H. Bullock School on the path to receive financial incentives. 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 considered sufficient to make "Go/No-Go" decisions and to prioritize energy projects. Savings are based on the New Jersey Board of Public Utilities New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016. Further analysis or investigation may be required to calculate more accurate savings to support any custom SmartStart, Pay for Performance, or Large Energy Users incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJ prescriptive SmartStart program. Depending on your implementation strategy, the project may be eligible for more lucrative incentives through other programs as identified in Section 8.

The following sections describe the evaluated measures. As shown, the facilities ECM recommendations primarily include lighting and vending machine controls. HVAC, food service and refrigeration equipment were evaluated however no ECM recommendations have been identified for two primary reasons.

1. The facility and associated equipment are less than eight years old.
2. The equipment's respective efficiency is acceptable leaving minimal opportunity for improvement and a cost-effective payback for early retirement.

4.1 Recommended ECMs

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

Figure 21 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**122,972**	**63.9**	**0.0**	**$18,222.21**	**$174,653.75**	**$19,125.00**	**$155,528.75**	**8.54**	**123,832**
ECM 1	Install LED Fixtures	44,072	37.8	0.0	$6,530.68	$87,588.98	$5,720.00	$81,868.98	12.54	44,380
ECM 2	Retrofit Fixtures with LED Lamps	78,900	26.0	0.0	$11,691.53	$87,064.77	$13,405.00	$73,659.77	6.30	79,451
Lighting Control Measures		**13,325**	**4.1**	**0.0**	**$1,974.54**	**$21,714.00**	**$1,435.00**	**$20,279.00**	**10.27**	**13,418**
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Plug Load Equipment Control - Vending Machine		**1,612**	**0.0**	**0.0**	**$238.85**	**$1,437.60**	**$0.00**	**$1,437.60**	**6.02**	**1,623**
ECM 5	Vending Machine Control	1,612	0.0	0.0	$238.85	$1,437.60	$0.00	$1,437.60	6.02	1,623
TOTALS		**137,909**	**68.0**	**0.0**	**$20,435.60**	**$197,805.35**	**$20,560.00**	**$177,245.35**	**8.67**	**138,873**

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

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

4.1.1 Lighting Upgrades

Our recommendations for lighting upgrades are summarized in Figure 22 below.

Figure 22 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**122,972**	**63.9**	**0.0**	**$18,222.21**	**$174,653.75**	**$19,125.00**	**$155,528.75**	**8.54**	**123,832**
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ECM 2	Retrofit Fixtures with LED Lamps	78,900	26.0	0.0	$11,691.53	$87,064.77	$13,405.00	$73,659.77	6.30	79,451

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	24,800	35.3	0.0	$3,674.92	$74,588.98	$3,720.00	$70,868.98	19.28	24,973
Exterior	19,272	2.5	0.0	$2,855.77	$13,000.00	$2,000.00	$11,000.00	3.85	19,407

Measure Description

This measure evaluates replacing existing fixtures containing incandescent and metal halide lamps with new high performance LED light fixtures. This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output. Typical areas at this facility include the stage lighting, the parking lot lighting, and the roof top mounted exterior fixture.

Maintenance savings are anticipated since LED sources have burn hours which are generally more than twice that of a fluorescent source and more than 10 times incandescent sources. Maintenance savings may be partially offset by the higher material costs associated with LED sources.

During planning and design for the installation of new fixtures, we recommend a holistic approach that considers both the technology of the lighting sources and how they are controlled.

ECM 2: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	73,159	25.3	0.0	$10,840.90	$83,627.46	$13,165.00	$70,462.46	6.50	73,671
Exterior	5,740	0.7	0.0	$850.63	$3,437.32	$240.00	$3,197.32	3.76	5,781

Measure Description

This measure evaluates replacing T5 and T8 linear fluorescent lamps with LED tube lamps and replacing compact fluorescent and incandescent lamps screw-in/plug-in based lamps with LED lamps. Many LED tube lamps are direct replacements for existing fluorescent lamps and can be installed although there is a fluorescent fixture ballast in place. Other tube lamps require that fluorescent fixture ballasts be removed or replaced with LED drivers. Screw-in/plug-in LED lamps can be used as a direct replacement for most other screw-in/plug-in lamps. This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output.

Maintenance savings are anticipated since LED sources have burn hours which are more than twice that of a fluorescent source and more than 10 times incandescent sources. LED lamps that use the existing fluorescent fixture ballast will be constrained by the remaining hours of the ballast. Maintenance savings may be partially offset by the higher material costs associated with LED sources.

During retrofit planning and design, we recommend a holistic approach that considers both the technology of the lighting sources and how they are controlled.

4.1.2 Lighting Control Measures

Our recommendations for lighting control measures are summarized in Figure 23 below.

Figure 23 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**13,325**	**4.1**	**0.0**	**$1,974.54**	**$21,714.00**	**$1,435.00**	**$20,279.00**	**10.27**	**13,418**
ECM 3	Install Occupancy Sensor Lighting Controls	8,310	2.6	0.0	$1,231.36	$11,114.00	$1,435.00	$9,679.00	7.86	8,368
ECM 4	Install High/Low Lighitng Controls	5,015	1.5	0.0	$743.18	$10,600.00	$0.00	$10,600.00	14.26	5,050

ECM 3: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
8,310	2.6	0.0	$1,231.36	$11,114.00	$1,435.00	$9,679.00	7.86	8,368

Measure Description

This measure evaluates installing occupancy sensors to control light fixtures that are currently manually controlled in classrooms, restrooms and storage rooms. Sensors detect occupancy using ultrasonic and/or infrared wave technologies. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Occupants will also be able to manually turn off fixtures. Energy savings result 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. Ceiling-mounted or remote-mounted sensors require the use of low voltage switching relays or a wireless signal to the switch. In general, use wall switch replacement sensors for single occupant offices and other small rooms. Install ceiling-mounted or remote mounted sensors in locations without local switching, in situations where the existing wall switches are not in the line-of-sight of the main work area, and in large spaces. We recommend a holistic design approach that considers both the technology of the lighting sources and how they are controlled.

Maintenance savings are anticipated due to reduced lamp operation, however, additional maintenance costs may be incurred because the occupancy sensors may require periodic adjustment; it is anticipated that the net effect on maintenance costs will be negligible.

ECM 4: Install High/Low Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
5,015	1.5	0.0	$743.18	$10,600.00	$0.00	$10,600.00	14.26	5,050

Measure Description

This measure evaluates installing occupancy sensors to provide dual level lighting control for light fixtures in spaces that are infrequently occupied but require continuous or night lighting for safety or security reasons. Typical areas for such lighting control are stairwells, interior corridors, parking lots and parking garages. At this facility, the measure has been recommended for corridors.

The light fixtures 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 wave technologies. The lighting systems are switched to the high level setting when an occupant is detected. Fixtures are automatically switched back to low level after an area has been vacant for a preset period.

For this application the occupancy sensors will generally be ceiling or fixture mounted. Sufficient sensor coverage should be provided to turn lights on in an area as an occupant approaches the area.

Maintenance savings are anticipated due to reduced lamp operation, however, additional maintenance costs may be incurred because the occupancy sensors may require periodic adjustment; it is anticipated that the net effect on maintenance costs will be negligible.

4.1.3 Plug Load Equipment Control - Vending Machine

Our recommendations for plug load equipment control measures are summarized in Figure 24 below.

Figure 24-Summary of Plug Load Equipment Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine		**1,612**	**0.0**	**0.0**	**$238.85**	**$1,437.60**	**$0.00**	**$1,437.60**	**6.02**	**1,623**
ECM 5	Vending Machine Control	1,612	0.0	0.0	$238.85	$1,437.60	$0.00	$1,437.60	6.02	1,623

ECM 5: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,612	0.0	0.0	$238.85	$1,437.60	$0.00	$1,437.60	6.02	1,623

Measure Description

Vending machines operate continuously, even during non-business hours. It is recommended to install occupancy sensor based controls to reduce the energy use. These controls power down the machine when the surrounding area is vacant, then monitor the surrounding temperature and power up the cooling system at regular intervals to keep the product cool. Savings are a function of the activity level around the vending machine. We recommend the measure for the refrigerated vending machine located in the staff room.

5 ENERGY EFFICIENT PRACTICES

In addition to the quantifiable savings estimated in Section 4, a facility's energy performance can also be improved through application of low or no-cost efficiency strategies. By employing certain behavioral and operational adjustments as well as performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and annual energy, operation, and maintenance costs can be reduced. The recommendations below are provided as a framework for developing a whole building maintenance plan that is customized to your facility. Consult with qualified equipment specialists for details on proper maintenance and system operation.

Reduce Air Leakage

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

Close Doors and Windows

Ensure doors and windows are closed in conditioned spaces. Leaving doors and windows open leads to a significant increase in heat transfer between conditioned spaces and the outside air. Reducing a facility's air changes per hour (ACH) can lead to increased occupant comfort as well as significant heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

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.

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.

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 ventilationenergy 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 SELF-GENERATION MEASURES

Self-generation measures include both renewable (e.g., solar, wind) and non-renewable (e.g., microturbines) 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

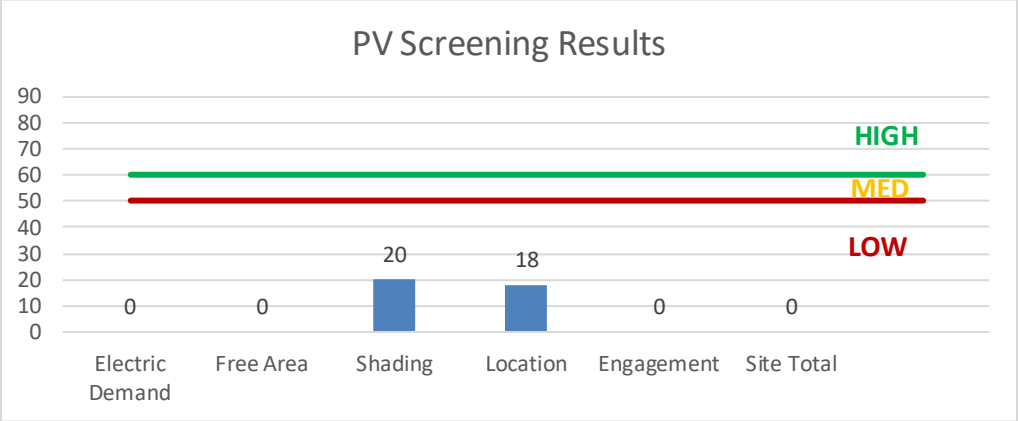
Sunlight can be converted into electricity using photovoltaics (PV) modules. Modules are racked together into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility's electrical 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 already uses electricity produced from solar panels on-site.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has a no potential for installing additional PV array.

In order to be cost-effective, a solar PV array generally needs a minimum of 4,000 square feet of flat or south-facing rooftop, or other unshaded space, on which to place the PV panels. In our opinion, the facility does appear not meet these minimum criteria for an additional cost-effective PV installation.

Figure 25 - Photovoltaic Screening



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

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

In non-industrial settings, combined heat and power (CHP) is the on-site generation of electricity and recovery of heat which is put to beneficial use. Common prime movers in CHP applications include reciprocating engines, microturbines, fuel cells, and (at large facilities) gas turbines. Electricity is typically interconnected to the sites local distribution system. Heat is recovered from the exhaust stream and the ancillary cooling system and interconnected to the existing hot water (or steam) distribution system.

CHP systems are typically used to produce a portion of the electricity needed by a facility, with the balance of electric needs satisfied by purchase from the grid. 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 no potential for installing a cost-effective CHP system.

7 DEMAND RESPONSE

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

By enabling grid operators to call upon Curtailment Service Providers and energy consumers 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 will receive payments whether or not their facility is called upon to curtail their load.

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 program often find it to be a valuable source of revenue for their facility(ies) because the payments can significantly offset annual utility 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 event cycle. DR program participants often have to install smart meters and may need to also sub-meter larger energy-using equipment, such as chillers, in order to demonstrate compliance with DR program requirements.

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

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

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding the program rules and requirements for metering and controls, a facility's ability to temporarily reduce electric load, as well as the payments involved in participating in the program. Also, these providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment to help ensure compliance of all terms and conditions of a DR contract.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and others, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's 1999 Electricity Restructuring Law which requires all customers of investor-owned electric and gas utilities to pay this charge on their monthly energy bills. As a contributor to the fund you were able to participate in the LGEA program and are also eligible to utilize the equipment incentive programs. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 26 for a list of the eligible programs identified for each recommended ECM.

Figure 26 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	X					
ECM 2	Retrofit Fixtures with LED Lamps	X					
ECM 3	Install Occupancy Sensor Lighting Controls	X					
ECM 4	Install High/Low Lighitng Controls						
ECM 5	Vending Machine Control						

SmartStart is generally well suited for implementation of individual or small sets of measures, with the flexibility to install projects at your own pace using in-house staff or a preferred contractor. Direct Install caters to small to mid-size facilities to bundle measures and simplify participation, 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 and 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; applicants can use in-house staff or preferred contractor.

Generally, the incentive values provided throughout the report assume the SmartStart program is utilized because it provides a consistent comparison of available incentives.

Brief descriptions of all relevant alternative financing and incentive programs are located in the sections below. You may also check the following website for further information, including most current program availability, requirements, and incentive levels: www.njcleanenergy.com/ci.

8.1 SmartStart

Overview

The SmartStart program is comprised of new construction and retrofit components that offer incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives for various energy efficiency equipment based on national/market trends, new technologies or changes in efficiency baselines.

Prescriptive Equipment Incentives 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

All customer sizes and types may be served by this program. This program provides an effective mechanism for securing incentives for individual projects that may be completed at once or over several years.

Incentives

The prescriptive path provides fixed incentives for specific energy efficiency measures whereas the custom measure path provides incentives for unique or specialized technologies that are not addressed through prescriptive offerings.

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 the lesser of 50% of the total installed incremental project cost, or a buy down to a one year payback. 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 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 the incentive programs to help further reduce costs when compiling the ESP. You should refer to the ESIP guidelines at the link above for further information and guidance on next steps.

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.22	152	0.0	$22.49	$585.00	$100.00	21.56
1st Floor main hallway	41	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	Yes	41	LED Screw-In Lamps: Downlight Solid State Retrofit	High/Low Control	22	1,330	0.44	1,462	0.0	$216.65	$3,206.09	$0.00	14.80
1st Floor main hallway	96	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	1,900	Relamp	Yes	96	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,330	2.50	8,327	0.0	$1,233.98	$8,816.00	$960.00	6.37
1st Floor main hallway	11	Compact Fluorescent: recessed 2x 13W 4-pin	Wall Switch	26	1,900	Relamp	Yes	11	LED Screw-In Lamps: Downlight Solid State Retrofit	High/Low Control	18	1,330	0.10	319	0.0	$47.23	$884.56	$0.00	18.73
1st Floor main hallway	7	Halogen Incandescent: MR16 75 W	Wall Switch	75	1,900	Relamp	Yes	7	LED Screw-In Lamps: Downlight Solid State Retrofit	High/Low Control	10	1,330	0.31	1,040	0.0	$154.12	$575.55	$70.00	3.28
1st Floor main hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,900	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	1,330	0.24	802	0.0	$118.83	$675.67	$100.00	4.84
Cafeteria	26	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	114	1,330	Relamp	No	26	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,330	0.95	2,227	0.0	$329.99	$2,473.47	$520.00	5.92
Boys Bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.05	182	0.0	$27.00	$387.00	$55.00	12.29
Boys Bathroom	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	1,900	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.04	135	0.0	$20.07	$117.00	$20.00	4.83
Girls Bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.05	182	0.0	$27.00	$233.00	$20.00	7.89
Girls Bathroom	1	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	21	0.0	$3.11	$44.05	$0.00	14.17
Room 105	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,900	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,330	0.12	410	0.0	$60.76	$341.60	$65.00	4.55
Room 112	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.55	1,822	0.0	$270.03	$1,710.00	$270.00	5.33
Room 112	3	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.02	63	0.0	$9.32	$132.15	$0.00	14.17
Room 110	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.55	1,822	0.0	$270.03	$1,710.00	$270.00	5.33
Room 110	3	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.02	63	0.0	$9.32	$132.15	$0.00	14.17
Gym Hallway	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,900	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	1,330	0.29	962	0.0	$142.59	$770.80	$120.00	4.56
Multipurpose Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.17	577	0.0	$85.48	$468.00	$80.00	4.54
Stage	28	Incandescent: 575W Flood Light	Wall Switch	575	400	Fixture Replacement	No	28	LED - Fixtures: Track or Mono-Point Directional Lighting Fixtures	Wall Switch	75	400	9.18	6,440	0.0	$954.29	$16,842.67	$840.00	16.77
Stage	96	Incandescent: 575W 2-pin Flood Light	Wall Switch	575	400	Fixture Replacement	No	96	LED - Fixtures: Track or Mono-Point Directional Lighting Fixtures	Wall Switch	75	400	31.46	22,080	0.0	$3,271.86	$57,746.30	$2,880.00	16.77
Gymnasium	30	Compact Fluorescent: 26W	Wall Switch	26	1,900	Relamp	No	30	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	18	1,900	0.15	511	0.0	$75.76	$1,612.59	$0.00	21.28
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	280	0.05	38	0.0	$5.68	$233.00	$20.00	37.47
Bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.04	144	0.0	$21.37	$117.00	$20.00	4.54
Room 108	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.55	1,822	0.0	$270.03	$1,710.00	$270.00	5.33
Room 108	3	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.02	63	0.0	$9.32	$132.15	$0.00	14.17

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 106	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.55	1,822	0.0	$270.03	$1,710.00	$270.00	5.33
Room 106	3	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.02	63	0.0	$9.32	$132.15	$0.00	14.17
Room 102	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.16	547	0.0	$81.01	$467.00	$80.00	4.78
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.02	72	0.0	$10.68	$58.50	$10.00	4.54
Bathroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,900	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,900	0.02	70	0.0	$10.36	$96.40	$20.00	7.37
Room 104	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.04	144	0.0	$21.37	$117.00	$20.00	4.54
Room 100	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.19	638	0.0	$94.51	$525.50	$90.00	4.61
Conference Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.11	364	0.0	$54.01	$350.00	$60.00	5.37
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.02	72	0.0	$10.68	$58.50	$10.00	4.54
Work Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.04	144	0.0	$21.37	$117.00	$20.00	4.54
Principal	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.04	144	0.0	$21.37	$117.00	$20.00	4.54
Principal	1	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	21	0.0	$3.11	$44.05	$0.00	14.17
Copy Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,900	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,330	0.12	410	0.0	$60.76	$341.60	$65.00	4.55
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.02	72	0.0	$10.68	$58.50	$10.00	4.54
Reception Area	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.15	505	0.0	$74.79	$409.50	$70.00	4.54
Teacher & Data Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.11	364	0.0	$54.01	$350.00	$60.00	5.37
Room 114	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.55	1,822	0.0	$270.03	$1,710.00	$270.00	5.33
Room 114	3	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.02	63	0.0	$9.32	$132.15	$0.00	14.17
Room 116	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.55	1,822	0.0	$270.03	$1,710.00	$270.00	5.33
Room 116	3	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.02	63	0.0	$9.32	$132.15	$0.00	14.17
Boys Bathroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.06	151	0.0	$22.44	$175.50	$30.00	6.48
Boys Bathroom	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	1,330	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.04	95	0.0	$14.05	$117.00	$20.00	6.90
Girls Bathroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.06	151	0.0	$22.44	$175.50	$30.00	6.48
Girls Bathroom	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	1,330	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.04	95	0.0	$14.05	$117.00	$20.00	6.90
Room 118	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.55	1,822	0.0	$270.03	$1,710.00	$270.00	5.33

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 118	3	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.02	63	0.0	$9.32	$132.15	$0.00	14.17
Room 120	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.55	1,822	0.0	$270.03	$1,710.00	$270.00	5.33
Room 120	3	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.02	63	0.0	$9.32	$132.15	$0.00	14.17
Custodian Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.02	15	0.0	$2.25	$58.50	$10.00	21.56
Mechanical Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.22	152	0.0	$22.49	$585.00	$100.00	21.56
Staff Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.02	72	0.0	$10.68	$58.50	$10.00	4.54
Room 124	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.32	757	0.0	$112.19	$877.50	$150.00	6.48
Room 124	4	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	4	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.03	59	0.0	$8.70	$176.20	$0.00	20.25
Room 126	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.32	757	0.0	$112.19	$877.50	$150.00	6.48
Room 126	4	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	4	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.03	59	0.0	$8.70	$176.20	$0.00	20.25
Bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.04	144	0.0	$21.37	$117.00	$20.00	4.54
Room 131	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.26	606	0.0	$89.75	$702.00	$120.00	6.48
Room 131	2	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	2	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.01	29	0.0	$4.35	$88.10	$0.00	20.25
Room 133A	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.22	729	0.0	$108.01	$584.00	$100.00	4.48
Room 133A	1	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	21	0.0	$3.11	$44.05	$0.00	14.17
Room 133B	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.22	729	0.0	$108.01	$584.00	$100.00	4.48
Room 133B	1	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	21	0.0	$3.11	$44.05	$0.00	14.17
Room 135	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.33	1,093	0.0	$162.02	$972.00	$155.00	5.04
Room 135	2	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	2	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	42	0.0	$6.22	$88.10	$0.00	14.17
Room 128	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.32	757	0.0	$112.19	$877.50	$150.00	6.48
Room 128	4	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	4	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.03	59	0.0	$8.70	$176.20	$0.00	20.25
Room 130	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.32	757	0.0	$112.19	$877.50	$150.00	6.48
Room 130	4	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	4	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.03	59	0.0	$8.70	$176.20	$0.00	20.25
Front Entrance	11	Incandescent: 75W	Wall Switch	75	1,900	Relamp	No	11	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	11	1,900	0.46	1,538	0.0	$227.94	$591.28	$110.00	2.11
Front Entrance	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.24	793	0.0	$117.53	$643.50	$110.00	4.54

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Electrical Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.09	61	0.0	$9.00	$234.00	$40.00	21.56
2nd Floor Hallway	29	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	Yes	29	LED Screw-In Lamps: Downlight Solid State Retrofit	High/Low Control	22	1,330	0.31	1,034	0.0	$153.24	$2,077.48	$0.00	13.56
2nd Floor Hallway	117	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	1,900	Relamp	Yes	117	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,330	3.04	10,149	0.0	$1,503.92	$10,844.50	$1,170.00	6.43
2nd Floor Hallway	8	Compact Fluorescent: recessed 2x13W 4-pin	Wall Switch	26	1,900	Relamp	Yes	8	LED Screw-In Lamps: Downlight Solid State Retrofit	High/Low Control	18	1,330	0.07	232	0.0	$34.35	$552.41	$0.00	16.08
Library	17	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,900	Relamp	Yes	17	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,330	0.82	2,726	0.0	$404.01	$1,887.27	$375.00	3.74
Library	55	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,900	Relamp	Yes	55	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,330	2.26	7,517	0.0	$1,113.88	$4,946.00	$930.00	3.61
Library	1	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	21	0.0	$3.11	$44.05	$0.00	14.17
Room 205C	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,900	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,330	0.16	547	0.0	$81.01	$416.80	$80.00	4.16
Room 205A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,900	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,330	0.16	547	0.0	$81.01	$416.80	$80.00	4.16
Bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.04	144	0.0	$21.37	$117.00	$20.00	4.54
Mechanical Room	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.48	334	0.0	$49.49	$1,287.00	$220.00	21.56
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	280	0.11	77	0.0	$11.37	$350.00	$40.00	27.27
Room 203	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.66	2,187	0.0	$324.04	$1,944.00	$310.00	5.04
Tech Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,900	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,330	0.12	410	0.0	$60.76	$341.60	$65.00	4.55
Room 210	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Room 210	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Room 208	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Room 208	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Room 206	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Room 206	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Room 204	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Room 204	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Room 207	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.04	144	0.0	$21.37	$117.00	$20.00	4.54
Room 202	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.60	2,005	0.0	$297.03	$1,827.00	$290.00	5.17
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	280	0.11	77	0.0	$11.37	$350.00	$40.00	27.27

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 200	42	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	42	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	1.15	3,827	0.0	$567.06	$3,267.00	$525.00	4.84
Room 200	2	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	2	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.01	29	0.0	$4.35	$88.10	$0.00	20.25
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.04	30	0.0	$4.50	$117.00	$20.00	21.56
Room 212	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,330	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,330	0.29	681	0.0	$100.97	$676.80	$135.00	5.37
Room 212	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.19	454	0.0	$67.31	$526.50	$90.00	6.48
Room 214	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.39	909	0.0	$134.63	$1,053.00	$180.00	6.48
Elevator Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	200	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.04	15	0.0	$2.25	$117.00	$20.00	43.12
Room 216	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Room 216	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Room 218	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Room 218	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Storage	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	280	0.27	192	0.0	$28.42	$701.00	$100.00	21.14
Staff Room	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,900	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,330	0.45	1,503	0.0	$222.78	$1,097.20	$200.00	4.03
Men Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.02	72	0.0	$10.68	$58.50	$10.00	4.54
Women Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.02	72	0.0	$10.68	$58.50	$10.00	4.54
Room 223A	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.22	729	0.0	$108.01	$584.00	$100.00	4.48
Room 223A	1	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	21	0.0	$3.11	$44.05	$0.00	14.17
Room 223B	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.22	729	0.0	$108.01	$584.00	$100.00	4.48
Room 223B	8	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	8	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.05	168	0.0	$24.87	$352.41	$0.00	14.17
Room 228	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Room 228	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Room 230	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Rooom 230	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Room 225	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.33	1,093	0.0	$162.02	$972.00	$155.00	5.04
Room 225	1	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	21	0.0	$3.11	$44.05	$0.00	14.17

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 224	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Room 224	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Room 226	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,330	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.43	1,009	0.0	$149.59	$1,170.00	$200.00	6.48
Room 226	3	Compact Fluorescent: recessed 32W 4-pin	Occupancy Sensor	32	1,330	Relamp	No	3	LED Screw-In Lamps: Downlight Solid State Retrofit	Occupancy Sensor	22	1,330	0.02	44	0.0	$6.53	$132.15	$0.00	20.25
Kitchen	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	26	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.56	1,875	0.0	$277.80	$1,521.00	$260.00	4.54
Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,330	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,330	0.03	76	0.0	$11.22	$75.20	$15.00	5.37
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.02	72	0.0	$10.68	$58.50	$10.00	4.54
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.02	72	0.0	$10.68	$58.50	$10.00	4.54
Dish Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.14	456	0.0	$67.51	$408.50	$70.00	5.01
Storage - Pump Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.17	121	0.0	$18.00	$468.00	$80.00	21.56
Perimeter Light	17	Compact Fluorescent: 26W 4-pin Wall Sconce	Daylight Dimming	26	4,380	Relamp	No	17	LED Screw-In Lamps: Downlight Solid State Retrofit	Daylight Dimming	18	4,380	0.09	668	0.0	$98.97	$748.87	$0.00	7.57
Perimeter Light	8	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Daylight Dimming	34	4,380	Relamp	No	8	LED - Linear Tubes: (2) 2' Lamps	Daylight Dimming	17	4,380	0.09	685	0.0	$101.51	$385.60	$80.00	3.01
Perimeter Light	8	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Daylight Dimming	120	4,380	Relamp	No	8	LED - Linear Tubes: (4) 4' Lamps	Daylight Dimming	58	4,380	0.33	2,498	0.0	$370.21	$761.07	$160.00	1.62
Perimeter Light	35	Compact Fluorescent: 2x26W 4-pin	Daylight Dimming	52	4,380	Relamp	No	35	LED Screw-In Lamps: Downlight Solid State Retrofit	Daylight Dimming	36	4,380	0.36	2,750	0.0	$407.53	$1,541.79	$0.00	3.78
Parking Lot Pole Lighting	19	Metal Halide: (1) 250W Lamp	Daylight Dimming	295	4,380	Fixture Replacement	No	19	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	75	4,380	2.74	21,055	0.0	$3,119.92	$12,350.00	$1,900.00	3.35
Boys Bathroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.08	273	0.0	$40.50	$445.50	$65.00	9.39
Boys Bathroom	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	1,900	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,900	0.04	135	0.0	$20.07	$117.00	$20.00	4.83
Boys Bathroom	1	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	21	0.0	$3.11	$44.05	$0.00	14.17
Girls Bathroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,330	0.08	273	0.0	$40.50	$445.50	$65.00	9.39
Girls Bathroom	2	Compact Fluorescent: recessed 32W 4-pin	Wall Switch	32	1,900	Relamp	No	2	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	22	1,900	0.01	42	0.0	$6.22	$88.10	$0.00	14.17
Girls Bathroom	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	1,900	Relamp	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	1,900	0.02	57	0.0	$8.42	$76.53	$20.00	6.72
Custodian	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	400	0.02	13	0.0	$1.91	$76.53	$20.00	29.62
Tech Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	1,900	0.02	61	0.0	$9.07	$76.53	$20.00	6.24
Mechanical Room	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,900	Relamp	No	12	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	1,900	0.22	734	0.0	$108.79	$918.40	$240.00	6.24
Roof Top	1	Metal Halide: (1) 250W Lamp	Daylight Dimming	295	4,380	Fixture Replacement	No	1	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	75	4,380	0.14	1,108	0.0	$164.21	$650.00	$100.00	3.35

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Boilers & Heat Pump	2	Water-Source Heat Pump Circulation Pump	0.8	78.0%	No	1,000	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boilers & Heat Pump	2	Water-Source Heat Pump Circulation Pump	5.0	90.2%	No	1,000	No	90.2%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boilers & Heat Pump	2	Water Supply Pump	1.0	75.5%	No	1,000	No	75.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boilers & Heat Pump	2	Other	0.3	80.0%	No	1,000	No	80.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Kitchen	1	Exhaust Fan	0.2	71.0%	No	2,000	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Kitchen	1	Exhaust Fan	0.5	72.0%	No	2,000	No	72.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	School	16	Ventilation Fan	5.0	87.0%	No	2,000	No	87.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boilers & Heat Pump	1	Water-Source Heat Pump Circulation Pump	0.5	78.0%	No	2,000	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Geothermal System	2	Water-Source Heat Pump Circulation Pump	25.0	94.1%	Yes	1,000	No	94.1%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	McQuay Air Handler	1	Supply Fan	7.5	86.0%	Yes	2,000	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	McQuay Air Handler	1	Return Fan	2.0	82.0%	No	2,000	No	82.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
School Facility	School Facility	40	Water Source HP	2.92	35.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School Facility	School Facility	16	Water Source HP	2.00	24.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School Facility	School Facility	6	Water Source HP	2.50	30.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School Facility	School Facility	3	Water Source HP	3.33	40.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School Facility	School Facility	2	Water Source HP	3.92	47.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School Facility	School Facility	5	Water Source HP	0.83	10.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School Facility	School Facility	2	Water Source HP	1.08	13.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School Facility	School Facility	2	Water Source HP	15.00	180.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School Facility	School Facility	1	Water Source HP	22.92	275.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	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	School	2	Non-Condensing Hot Water Boiler	1,739.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Kitchen	1	Furnace	324.00	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
Storage Room	School Building	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

	Existing Conditions		Proposed Conditions			Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Low Temp Freezer (-35F to -5F)	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

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	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 (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Refrigerator, Solid Door (≤15 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

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker 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	Ice Making Head (<450 lbs/day), Batch	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Gas Convection Oven (Full Size)	Yes	No	0.00	0	0.0	$0.00	$9,290.04	$500.00	0.00
Kitchen	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	$0.00	$16,598.81	$750.00	0.00
Kitchen	1	Gas Fryer	Yes	No	0.00	0	0.0	$0.00	$5,620.63	$749.00	0.00
Kitchen	1	Gas Convection Oven (Full Size)	Yes	No	0.00	0	0.0	$0.00	$9,290.04	$500.00	0.00
Kitchen	1	Insulated Food Holding Cabinet (Full Size)	Yes	No	0.00	0	0.0	$0.00	$2,878.43	$300.00	0.00

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
School	45	Desktop Computer	191.0	Yes
School	2	Copy Machine	850.0	Yes
School	5	Microwave	800.0	No
School	5	Printer	125.0	Yes
Staff Room	1	Refrigerator	225.0	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
Staff Room	1	Refrigerated	Yes	0.00	1,612	0.0	$238.85	$718.80	$0.00	3.01
Staff Room	1	Non-Refrigerated	No	0.00	0	0.0	$0.00	$718.80	$0.00	0.00

Appendix B: ENERGY STAR® Statement of Energy Performance

Statement of Energy Performance was not generated for this facility due to incomplete utility data information.