Local Government Energy Audit:
Energy Audit Report

Millville Public Charter School Complex

Friends of Millville Public Charter School

1101 Wheaton Ave, Suite 220
Millville, NJ 08332

October 12, 2018

Final Report by:

TRC Energy Services

Disclaimer

The intent of this energy analysis report is to identify energy savings opportunities and recommend upgrades to the facility's energy using equipment and systems. Approximate saving 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 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 Millville Public Charter School Complex.

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

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

1.1 Facility Summary

Millville Public Charter School Complex is a 67,000 square foot facility comprised of classroom, multipurpose, and office space types within a single building. The building is two floors in most areas and includes school administration offices, leased offices, a cafeteria, classrooms, and a basement mechanical space.

Lighting consists of a diverse mix of lighting technologies and fixture types, some aging or inefficient. These include fluorescent, LED, HID, and incandescent lamps. HVAC equipment varies in system type, and some need replacement. The building cooling is provided by air-handling units with direct exchange cooling coils, split or package air-conditioning units, ductless mini-split air-conditioners, terminal package air-conditioners, and window air-conditioners. Heating is provided through two small heating hot water boilers, package heat pumps, package air-conditioners with gas furnaces, and electric resistance baseboard heaters. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC Energy Services evaluated and recommends 10 measures which together represent an opportunity to reduce annual energy costs by $32,245 and annual greenhouse gas emissions by 186,450 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 5.3 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce Millville Public Charter School Complex's annual energy use by 14%.

Figure 1 – Previous 12 Month Utility Costs

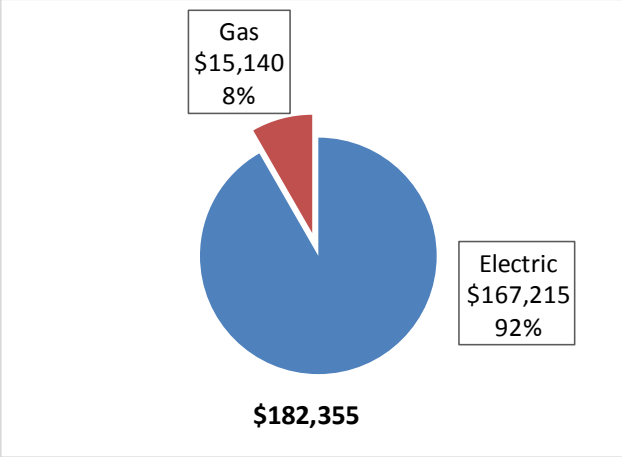
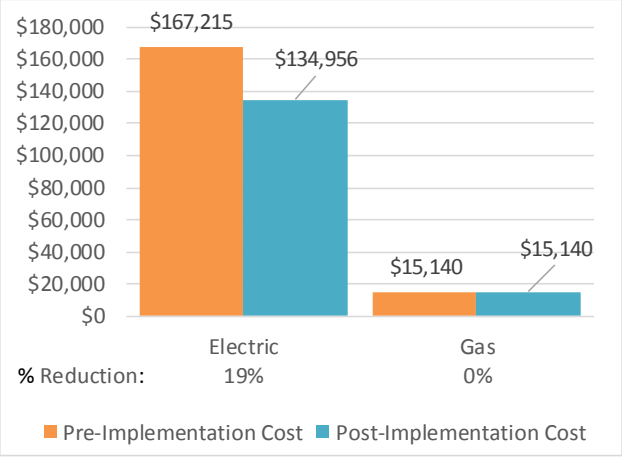


Figure 2 – Potential Post-Implementation Costs



A detailed description of Millville Public Charter School Complex's existing energy use can be found in Section 3 "Site Energy Use and Costs".

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

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**105,725**	**17.2**	**0.0**	**$18,412.32**	**$53,119.53**	**$7,660.00**	**$45,459.53**	**2.5**	**106,464**
ECM 1	Install LED Fixtures	Yes	9,005	1.2	0.0	$1,568.30	$6,641.51	$1,700.00	$4,941.51	3.2	9,068
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	3,835	0.7	0.0	$667.92	$3,119.00	$0.00	$3,119.00	4.7	3,862
ECM 3	Retrofit Fixtures with LED Lamps	Yes	89,818	15.2	0.0	$15,642.15	$39,594.60	$5,960.00	$33,634.60	2.2	90,446
ECM 4	Install LED Exit Signs	Yes	3,066	0.2	0.0	$533.95	$3,764.43	$0.00	$3,764.43	7.1	3,087
Lighting Control Measures			**25,609**	**4.4**	**0.0**	**$4,459.82**	**$37,740.00**	**$4,200.00**	**$33,540.00**	**7.5**	**25,788**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	22,548	3.9	0.0	$3,926.86	$34,140.00	$4,200.00	$29,940.00	7.6	22,706
ECM 6	Install High/Low Lighitng Controls	Yes	3,060	0.5	0.0	$532.97	$3,600.00	$0.00	$3,600.00	6.8	3,082
Motor Upgrades			**2,535**	**0.6**	**0.0**	**$441.42**	**$7,047.56**	**$0.00**	**$7,047.56**	**16.0**	**2,552**
ECM 7	Premium Efficiency Motors	Yes	2,535	0.6	0.0	$441.42	$7,047.56	$0.00	$7,047.56	16.0	2,552
Variable Frequency Drive (VFD) Measures			**27,243**	**7.6**	**0.0**	**$4,744.46**	**$36,285.35**	**$4,560.00**	**$31,725.35**	**6.7**	**27,434**
ECM 8	Install VFDs on Constant Volume (CV) HVAC	Yes	27,243	7.6	0.0	$4,744.46	$36,285.35	$4,560.00	$31,725.35	6.7	27,434
Electric Unitary HVAC Measures			**19,896**	**11.8**	**0.0**	**$3,464.91**	**$56,288.46**	**$3,621.00**	**$52,667.46**	**15.2**	**20,035**
ECM 9	Install High Efficiency Electric AC	Yes	19,896	11.8	0.0	$3,464.91	$56,288.46	$3,621.00	$52,667.46	15.2	20,035
Domestic Water Heating Upgrade			**4,148**	**0.0**	**0.0**	**$722.41**	**$93.21**	**$0.00**	**$93.21**	**0.1**	**4,177**
ECM 10	Install Low-Flow Domestic Hot Water Devices	Yes	4,148	0.0	0.0	$722.41	$93.21	$0.00	$93.21	0.1	4,177
TOTALS FOR HIGH PRIORITY MEASURES			**185,155**	**41.6**	**0.0**	**$32,245.34**	**$190,574.11**	**$20,041.00**	**$170,533.11**	**5.3**	**186,450**
TOTALS FOR ALL EVALUATED MEASURES			**185,155**	**41.6**	**0.0**	**$32,245.34**	**$190,574.11**	**$20,041.00**	**$170,533.11**	**5.3**	**186,450**

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

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

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

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

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

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

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

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

Energy Efficient Practices

TRC Energy Services also identified 5 low cost or no cost energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at Millville Public Charter School Complex include:

- Perform Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Clean Evaporator/Condenser Coils on AC Systems
- Perform Water Heater Maintenance
- Water Conservation

For details on these Energy Efficient Practices, please refer to Section 5.

On-Site Generation Measures

TRC Energy Services evaluated the potential for installing on-site generation for Millville Public Charter School Complex. Based on the configuration of the site and its loads there is a high potential for installing a photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	High	
System Potential	166	kW DC STC
Electric Generation	197,767	kWh/yr
Displaced Cost	$17,210	/yr
Installed Cost	$431,600	

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

1.3 Implementation Planning

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

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

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

- SmartStart
- Pay for Performance - Existing Building (P4P)

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

Larger facilities with an interest in a more comprehensive whole building approach to energy conservation should consider participating in the Pay for Performance (P4P) program. Projects eligible for this project program must meet minimum savings requirements. Final incentives are calculated based on actual measured performance achieved at the end of the project. The application process is more involved, and it requires working with a qualified P4P contractor, but the process may result in greater energy savings overall and more lucrative incentives, up to 50% of project's total cost.

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

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Douglas McGarry	Business Administrator	dmcgarry@cccharters.org	856-691-1611
Designated Representative			
David Shoemaker	Facility Manager	dshoemaker@cccharters.org	609-923-1952
TRC Energy Services			
Moussa Traore	Auditor	MTraore@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On May 22, 2018, TRC performed an energy audit at Millville Public Charter School Complex located in Millville, NJ. TRC's auditor met with David Shoemaker to review the facility operations and help focus our investigation on specific energy-using systems.

Millville Public Charter School Complex is a 67,000 square foot facility comprised of classroom, multipurpose, and office space types within a single building. The building is two floors in most areas and includes school administration offices, leased offices, a cafeteria, classrooms, and a basement mechanical space.

Lighting at Millville Public Charter School Complex consists of a diverse mix of lighting technologies and fixture types, some aging or inefficient. These include fluorescent, LED, HID, and incandescent lamps. HVAC equipment also varies by system type, and some need replacement. The building cooling is provided by air-handling units with direct exchange cooling coils, split or package air-conditioning units, ductless mini-split air-conditioners, terminal package air-conditioners, and window air-conditioners. Heating is provided through two small heating hot water boilers, package heat pumps, package air-conditioners with gas furnaces, and electric resistance baseboard heaters. A thorough description of the facility and our observations follow.

The building was constructed in 1950. In 2015 the facility performed a renovation which replaced some of the less efficient lighting fixtures with LED fixtures and some of the rooftop package units with more efficient ones.

2.3 Building Occupancy

The building is open Monday through Friday. The typical schedule is presented in the table below. The facility is primarily occupied during the school year which begins in late August and ends in mid-June. Some faculty and tenants lease office space and are present outside of the school year. During a typical day, the facility is occupied by students and faculty.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Millville Public Charter School Complex	Weekday	7:45 AM - 3:45 PM
Millville Public Charter School Complex	Weekend	Closed

2.4 Building Envelope

The building is constructed of brick masonry and structural steel. The building has flat roof sections covered with black membrane that is in good condition, as it is relatively new. The buildings have double pane windows which are in good condition and show little sign of excessive infiltration. The exterior doors are constructed of wood or metal, and the wooden doors are scheduled for replacement. Metal doors are in good condition.

Figure 7 - Building Exterior and Envelope

2.5 Energy-Using Systems

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

Lighting System

Lighting is provided mostly by linear 32-Watt fluorescent T8 lamps with electronic ballasts as well as by LED fixtures having either linear or screw-in lamps. There are also a variety of other lighting types including some compact fluorescent lamps (CFL), metal halide lamps, and incandescent lamps. Most of the LED and T8 fixtures are 2-lamp or 3-lamp, 4-foot long troffers with diffusers. There are also a few 2-lamp, 8-foot T12 fixtures. The LGEA application indicated that the building had a renovation in 2015 which included the installation of the LED fixtures present in the facility.

Interior lighting is controlled by manual switches. Stairwells, corridors, and main lobby areas do not contain any occupancy sensors and operate throughout the day.

Exterior lighting consists primarily of wall packs with LED lamps, however some fixtures contain metal halide or high-pressure sodium (HPS) sources. Some soffit lighting is on a time clock that has a daily schedule of 5:00 pm to 6:30 am, others are controlled by photocells.

Figure 8 – Lighting System Fixtures

Hot Water Heating System

The hot water system consists of two Weil McClain Ultra 230 condensing boilers, each with a 207 kBtu/hr output. The boilers have a nominal combustion efficiency of 94%. The boilers are configured in a constant flow distribution with a single 1/8 hp pump. The boilers provide hot water to hot water baseboard heaters in some of the offices of the building.

The full capacity of both boilers may be required during cold weather. The boilers are relatively new, in good condition, and well maintained.

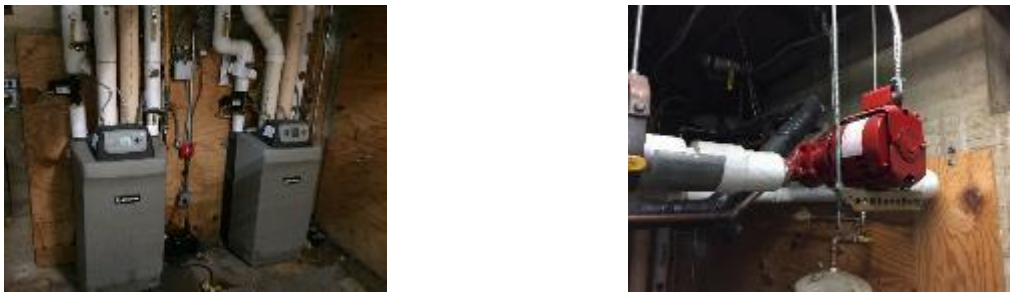


Figure 9 – Hot Water Heating Equipment

Direct Expansion Air Conditioning System (DX)

The facility has several different types of DX air conditioning systems. The most prevalent system types are package and split air conditioning systems. There are a total of 23 units which range from 3 to 30 tons for a total of about 94 tons cooling capacity. Most of the package units are equipped with economizers. Nine of the package units have gas furnaces for a total heating capacity of about 1,250 kBtu/hr. Most of the package units are relatively new, but the split systems are aged, with some needing replacement. Both package and split units are controlled by Honeywell thermostats located in the respective zones to maintain a setpoint of about 72°F.

The remaining cooling needs are provided by window air conditioning units, package terminal air conditioners, and ductless mini-split air conditioners. In total they provide about 13 tons of cooling capacity. Each of the terminal package air conditioners also have 3.5 kW electric resistance heaters. These units are controlled via integrated thermostats to maintain space temperature, and setpoints are adjustable by staff.

Supply fans on most of the air handlers, fan coils, and package units are constant volume and have fan motors ranging from 1.5 to 7.5 hp. Two of the air handlers are equipped with two speed motors.

Figure 10 – Direct Expansion Air Conditioning Equipment

Building Energy Management System (BEMS)

Most of the HVAC in the facility is controlled with Honeywell programmable thermostats which can be accessed and set through a web-based portal. These thermostats act as a simplified BEMS and allows the facility to set occupied and unoccupied schedules and setpoints, as well as notifications in the event of any temperature or humidity issues.

Depending on the area, the system has an occupied cooling setpoint of either 72°F or 73°F, and an occupied heating setpoint of either 69°F or 70°F, respective to the cooling setpoints. During unoccupied periods the heating setpoint is lowered to 60°F and the cooling setpoint is raised to 80°F.

Figure 11 – Building Energy Management System Settings

Domestic Hot Water Heating System

The domestic hot water heating system consists of five electric hot water heaters with an input rating ranging from 1.5 kW to 6 kW. Each water heater has a different storage tank capacity which ranges from 20 gallons to 119 gallons. Most of the hot water heaters are located in the basement.


Figure 12 – Domestic Hot Water Heating Equipment

Food Service and Laundry Equipment

The school has a small kitchen area that is used to prepare lunches for the students and staff. The cooking is done using a single full size electric convection oven. There is also an electric combination washing machine and dryer located near the kitchen.


Figure 13 – Food Service and Laundry Equipment

Refrigeration

The kitchen has two double-door, reach-in refrigerators, a single-door reach-in freezer, and a double-door reach-in freezer that is used to store prepared lunches. The refrigerators and larger freezer have about 50 cubic feet of capacity each and the smaller freezer has about 20 cubic feet.

Figure 14 – Refrigeration Equipment

Building Plug Load

There are roughly 121 computer work stations, 13 printers, and 11 copiers throughout the facility. Most of the computers are desktop units with LCD monitors. There is no centralized PC power management software installed.

There are also various kitchen and breakroom appliances, such as coffee makers, toasters, water coolers, and microwaves.

There are five standard refrigerator/freezers throughout the facility and a couple small freezers used for personal food storage.

Lastly, there are three portable dehumidifiers in the facility.

Figure 15 – Plug Load Equipment

2.6 Water-Using Systems

There are multiple restrooms at this facility. A sampling of restrooms found that 13 of the faucets are rated for 2.2 gpm or higher, the remaining are rated as low-flow.

Figure 16 – Water Fixtures

3 SITE ENERGY USE AND COSTS

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

3.1 Total Cost of Energy

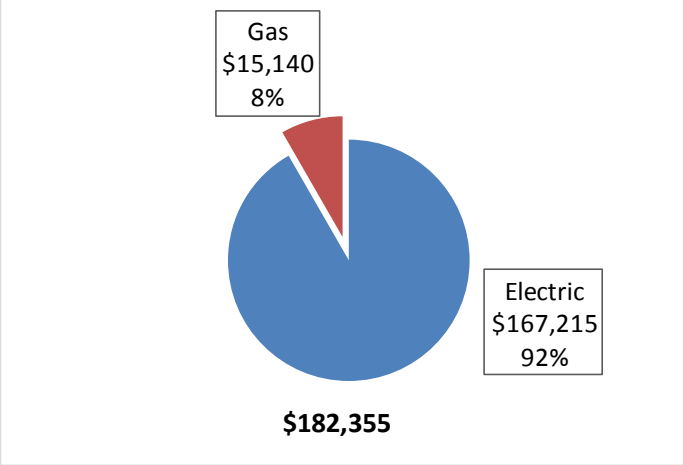
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 17 - Utility Summary

Utility Summary for Millville Public Charter School Complex		
Fuel	**Usage**	**Cost**
Electricity	960,158 kWh	$167,215
Natural Gas	12,340 Therms	$15,140
Total		**$182,355**

The current annual energy cost for this facility is $182,355 as shown in the chart below.

Figure 18 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by Atlantic City Electric. The average electric cost over the past 12 months was $0.174/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The electricity account was opened at the end of January, and the first billing cycle included a larger number of days than subsequent billing months, which is why the March consumption appears so much higher. Other than that, usage is relatively consistent, but had a spike in January and February likely due to an increase in electric resistance heating. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 19 - Graph of 12 Months Electric Usage & Demand

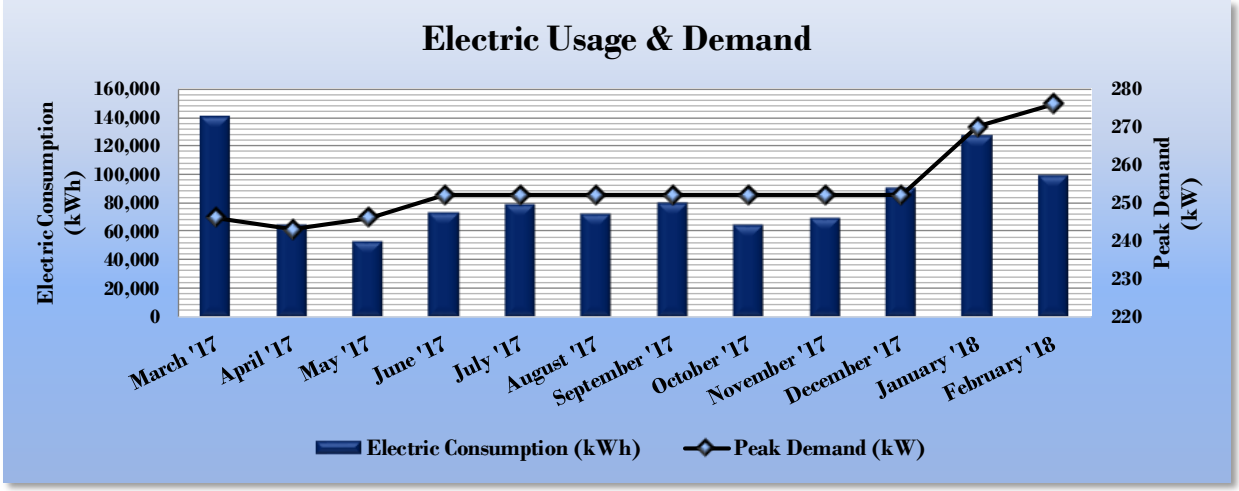


Figure 20 - Table of 12 Months Electric Usage & Demand

Electric Billing Data for Millville Public Charter School Complex					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
3/16/17	51	140,600	246	$652	$24,912
4/13/17	28	64,400	243	$472	$11,549
5/12/17	29	53,400	246	$371	$9,749
6/14/17	33	73,200	252	$472	$13,075
7/14/17	30	79,200	252	$479	$13,820
8/14/17	31	72,600	252	$495	$12,797
9/16/17	33	80,400	252	$527	$14,380
10/13/17	27	64,600	252	$223	$11,417
11/14/17	32	69,200	252	$473	$11,917
12/14/17	30	90,800	252	$444	$15,169
1/16/18	33	127,200	270	$523	$21,157
2/14/18	29	99,800	276	$470	$16,895
Totals	**386**	**1,015,400**	**276**	**$5,600**	**$176,835**
Annual	**365**	**960,158**	**276**	**$5,295**	**$167,215**

3.3 Natural Gas Usage

Natural gas is provided by South Jersey Gas. The average gas cost for the past 12 months is $1.227/therm, which is the blended rate used throughout the analyses in this report. Gas consumption is entirely dependent on the heating needs of the facility which is why there is no consumption in summer and larger consumption in the months of January and February. The monthly gas consumption is shown in the chart below.

Figure 21 - Natural Gas Usage

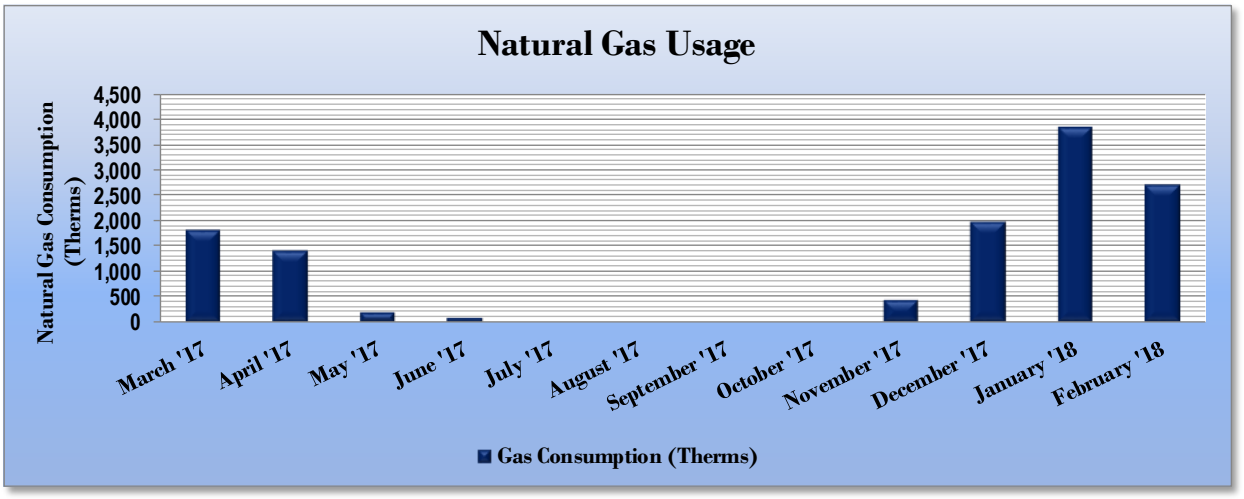


Figure 22 - Natural Gas Usage

Gas Billing Data for Millville Public Charter School Complex			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
3/13/17	30	1,813	$2,015
4/12/17	30	1,407	$1,544
5/11/15	29	187	$233
6/12/17	32	72	$111
7/13/17	31	0	$30
8/11/17	29	0	$28
9/14/17	34	0	$33
10/12/17	28	0	$27
11/11/17	30	424	$487
12/13/17	32	1,972	$2,396
1/15/18	33	3,859	$4,828
2/14/18	30	2,707	$3,530
Totals	**368**	**12,441**	**$15,265**
Annual	**365**	**12,340**	**$15,140**

3.4 Benchmarking

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

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

Figure 23 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Millville Public Charter School Complex	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	172.9	141.4
Site Energy Use Intensity (kBtu/ft^2)	67.3	58.2

Implementation of all recommended measures in this report would improve the building's estimated EUI significantly, as shown in the Table below:

Figure 24 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Millville Public Charter School Complex	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	143.3	141.4
Site Energy Use Intensity (kBtu/ft^2)	57.9	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR™ score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This building type does not currently qualify to receive a score.

A Portfolio Manager Statement of Energy Performance (SEP) was generated for this facility, see

Appendix B: ENERGY STAR® Statement of Energy Performance.

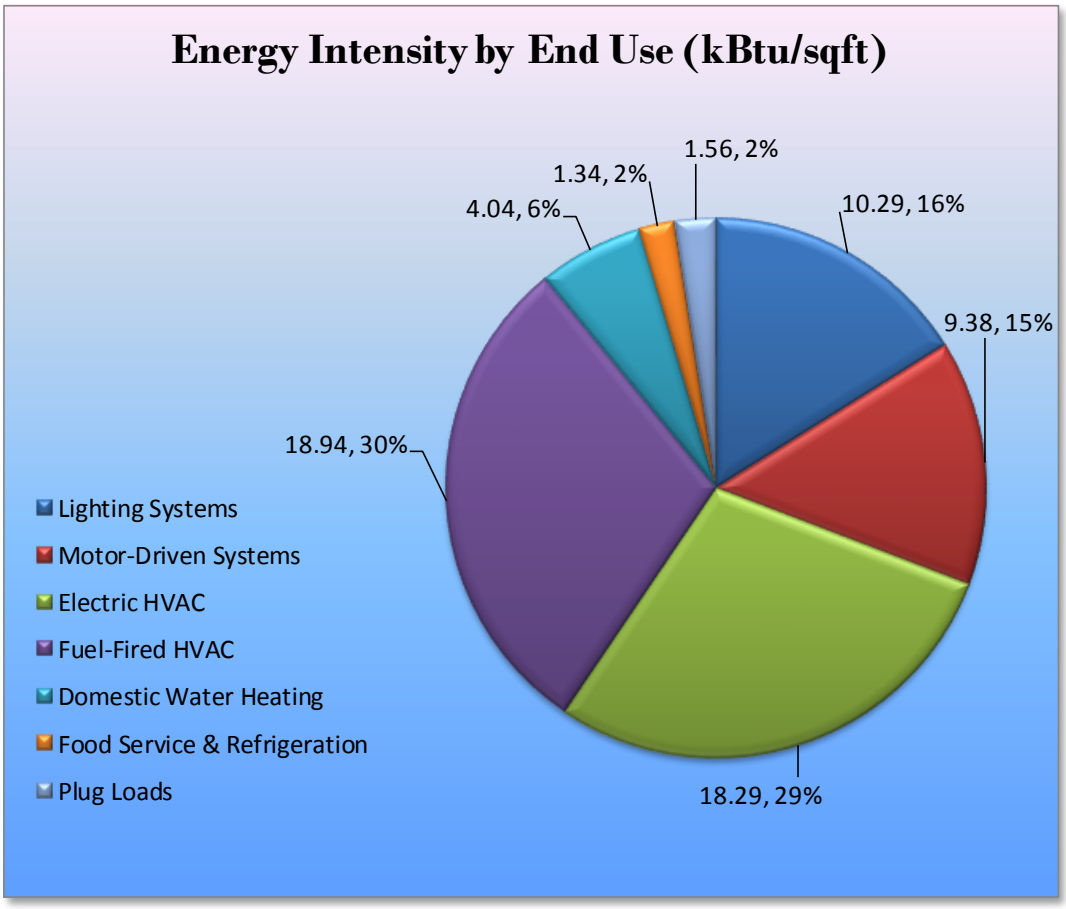
For more information on Energy Star certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1

A Portfolio Manager account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio Manager regularly, so that you can keep track of your building's performance. Free online training is available to help you use Energy Star Portfolio Manager to track your building's performance at: https://www.energystar.gov/buildings/training

3.5 Energy End-Use Breakdown

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

Figure 25 - Energy Balance (% and kBtu/SF)



4 Energy Conservation Measures

Level of Analysis

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

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 26 – 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		**105,725**	**17.2**	**0.0**	**$18,412.32**	**$53,119.53**	**$7,660.00**	**$45,459.53**	**2.5**	**106,464**
ECM 1	Install LED Fixtures	9,005	1.2	0.0	$1,568.30	$6,641.51	$1,700.00	$4,941.51	3.2	9,068
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	3,835	0.7	0.0	$667.92	$3,119.00	$0.00	$3,119.00	4.7	3,862
ECM 3	Retrofit Fixtures with LED Lamps	89,818	15.2	0.0	$15,642.15	$39,594.60	$5,960.00	$33,634.60	2.2	90,446
ECM 4	Install LED Exit Signs	3,066	0.2	0.0	$533.95	$3,764.43	$0.00	$3,764.43	7.1	3,087
Lighting Control Measures		**25,609**	**4.4**	**0.0**	**$4,459.82**	**$37,740.00**	**$4,200.00**	**$33,540.00**	**7.5**	**25,788**
ECM 5	Install Occupancy Sensor Lighting Controls	22,548	3.9	0.0	$3,926.86	$34,140.00	$4,200.00	$29,940.00	7.6	22,706
ECM 6	Install High/Low Lighitng Controls	3,060	0.5	0.0	$532.97	$3,600.00	$0.00	$3,600.00	6.8	3,082
Motor Upgrades		**2,535**	**0.6**	**0.0**	**$441.42**	**$7,047.56**	**$0.00**	**$7,047.56**	**16.0**	**2,552**
ECM 7	Premium Efficiency Motors	2,535	0.6	0.0	$441.42	$7,047.56	$0.00	$7,047.56	16.0	2,552
Variable Frequency Drive (VFD) Measures		**27,243**	**7.6**	**0.0**	**$4,744.46**	**$36,285.35**	**$4,560.00**	**$31,725.35**	**6.7**	**27,434**
ECM 8	Install VFDs on Constant Volume (CV) HVAC	27,243	7.6	0.0	$4,744.46	$36,285.35	$4,560.00	$31,725.35	6.7	27,434
Electric Unitary HVAC Measures		**19,896**	**11.8**	**0.0**	**$3,464.91**	**$56,288.46**	**$3,621.00**	**$52,667.46**	**15.2**	**20,035**
ECM 9	Install High Efficiency Electric AC	19,896	11.8	0.0	$3,464.91	$56,288.46	$3,621.00	$52,667.46	15.2	20,035
Domestic Water Heating Upgrade		**4,148**	**0.0**	**0.0**	**$722.41**	**$93.21**	**$0.00**	**$93.21**	**0.1**	**4,177**
ECM 10	Install Low-Flow Domestic Hot Water Devices	4,148	0.0	0.0	$722.41	$93.21	$0.00	$93.21	0.1	4,177
TOTALS		**185,155**	**41.6**	**0.0**	**$32,245.34**	**$190,574.11**	**$20,041.00**	**$170,533.11**	**5.3**	**186,450**

* - 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).

Please see **Appendix A: Equipment Inventory & Recommendations** for a detailed list of the locations and recommended upgrades for each lighting measure.

4.1.1 Lighting Upgrades

Recommended upgrades to existing lighting fixtures are summarized in Figure 27 below.

Figure 27 – 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		**105,725**	**17.2**	**0.0**	**$18,412.32**	**$53,119.53**	**$7,660.00**	**$45,459.53**	**2.5**	**106,464**
ECM 1	Install LED Fixtures	9,005	1.2	0.0	$1,568.30	$6,641.51	$1,700.00	$4,941.51	3.2	9,068
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	3,835	0.7	0.0	$667.92	$3,119.00	$0.00	$3,119.00	4.7	3,862
ECM 3	Retrofit Fixtures with LED Lamps	89,818	15.2	0.0	$15,642.15	$39,594.60	$5,960.00	$33,634.60	2.2	90,446
ECM 4	Install LED Exit Signs	3,066	0.2	0.0	$533.95	$3,764.43	$0.00	$3,764.43	7.1	3,087

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

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0
Exterior	9,005	1.2	0.0	$1,568.30	$6,641.51	$1,700.00	$4,941.51	3.2	9,068

Measure Description

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

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes nearly twice those of the fixtures recommended for replacement.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	3,835	0.7	0.0	$667.92	$3,119.00	$0.00	$3,119.00	4.7	3,862
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

ECM 3: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	86,205	14.7	0.0	$15,012.84	$39,003.31	$5,905.00	$33,098.31	2.2	86,807
Exterior	3,614	0.5	0.0	$629.30	$591.28	$55.00	$536.28	0.9	3,639

Measure Description

We recommend retrofitting interior T8 and T12 fluorescent, compact fluorescent, and incandescent lighting technologies as well as interior and exterior halogen lighting technologies with LED lamps. Many LED tube lamps are direct replacements for existing fluorescent lamps and can be installed while leaving the fluorescent fixture ballast in place. LED bulbs can be used in existing fixtures as a direct replacement for most other lighting technologies. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

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

ECM 4: Install LED EXIT Signs

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	3,066	0.2	0.0	$533.95	$3,764.43	$0.00	$3,764.43	7.1	3,087
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

4.1.2 Lighting Control Measures

Figure 28 – 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		**25,609**	**4.4**	**0.0**	**$4,459.82**	**$37,740.00**	**$4,200.00**	**$33,540.00**	**7.5**	**25,788**
ECM 5	Install Occupancy Sensor Lighting Controls	22,548	3.9	0.0	$3,926.86	$34,140.00	$4,200.00	$29,940.00	7.6	22,706
ECM 6	Install High/Low Lighitng Controls	3,060	0.5	0.0	$532.97	$3,600.00	$0.00	$3,600.00	6.8	3,082

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

ECM 5: 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)
22,548	3.9	0.0	$3,926.86	$34,140.00	$4,200.00	$29,940.00	7.6	22,706

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in restrooms, storage rooms, classrooms, offices areas, kitchen, mechanical areas, auditorium and basement. Lighting sensors detect occupancy using ultrasonic and/or infrared sensors. For most spaces, we recommend lighting controls use dual technology sensors, which can eliminate the possibility of any lights turning off unexpectedly. Lighting systems are enabled when an occupant is

detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Some controls also provide dimming options and all modern occupancy controls can be easily over-ridden by room occupants to allow them to manually turn fixtures on or off, as desired. Energy savings results from only operating lighting systems when they are required.

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

ECM 6: 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)
3,060	0.5	0.0	$532.97	$3,600.00	$0.00	$3,600.00	6.8	3,082

Measure Description

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

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

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

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

4.1.3 Motor Upgrades

ECM 7: Premium Efficiency Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
2,535	0.6	0.0	$441.42	$7,047.56	$0.00	$7,047.56	16.0	2,552

Measure Description

The replacement of standard efficiency motors with *NEMA Premium™* efficiency motors has been proposed to account for costs associated with the requirement for upgrading to inverter duty rated motors when installing variable frequency drives. Due to the marginal payback of this measure, motor replacement should be reconsidered if variable frequency drives are not going to be installed. Our evaluation assumes that existing motors will be replaced with motors of equivalent size and type. Although occasionally additional savings can be achieved by downsizing motors to better meet the motor's current load requirements. The base case motor efficiencies are estimated from nameplate information and our best estimates of motor run hours. Efficiencies of proposed motor upgrades are obtained from the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*. Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours.

4.1.4 Variable Frequency Drive Measures

Our recommendations for variable frequency drive (VFD) measures are summarized in Figure 29 below.

Figure 29 – Summary of Variable Frequency Drive ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**27,243**	**7.6**	**0.0**	**$4,744.46**	**$36,285.35**	**$4,560.00**	**$31,725.35**	**6.7**	**27,434**
ECM 8	Install VFDs on Constant Volume (CV) HVAC	27,243	7.6	0.0	$4,744.46	$36,285.35	$4,560.00	$31,725.35	6.7	27,434

ECM 8: Install VFDs on Constant Volume (CV) HVAC

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
27,243	7.6	0.0	$4,744.46	$36,285.35	$4,560.00	$31,725.35	6.7	27,434

Measure Description

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

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

4.1.5 Electric Unitary HVAC Measures

Our recommendations for unitary HVAC measures are summarized in Figure 30 below.

Figure 30 - Summary of Unitary HVAC 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)
Electric Unitary HVAC Measures		**19,896**	**11.8**	**0.0**	**$3,464.91**	**$56,288.46**	**$3,621.00**	**$52,667.46**	**15.2**	**20,035**
ECM 9	Install High Efficiency Electric AC	19,896	11.8	0.0	$3,464.91	$56,288.46	$3,621.00	$52,667.46	15.2	20,035

ECM 9: Install High Efficiency Air Conditioning Units

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
19,896	11.8	0.0	$3,464.91	$56,288.46	$3,621.00	$52,667.46	15.2	20,035

Measure Description

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

4.1.6 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 31 below.

Figure 31 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**4,148**	**0.0**	**0.0**	**$722.41**	**$93.21**	**$0.00**	**$93.21**	**0.1**	**4,177**
ECM 10	Install Low-Flow Domestic Hot Water Devices	4,148	0.0	0.0	$722.41	$93.21	$0.00	$93.21	0.1	4,177

ECM 10: Install Low-Flow DHW Devices

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
4,148	0.0	0.0	$722.41	$93.21	$0.00	$93.21	0.1	4,177

Measure Description

We recommend installing low-flow domestic hot water devices to reduce overall hot water demand. Energy demand from domestic hot water heating systems can be reduced by reducing water usage in general. Faucet aerators can reduce hot water usage, relative to standard aerators, which saves energy.

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

5 ENERGY EFFICIENT PRACTICES

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

Perform 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.

Clean Evaporator/Condenser Coils on AC Systems

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

Perform 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 gpm for bathroom faucets, 2.0 gpm for showerheads, and 1.28 gpm for pre-rinse spray valves.

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

Refer to Section 0 for any low-flow ECM recommendations.

6 On-Site Generation Measures

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

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

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

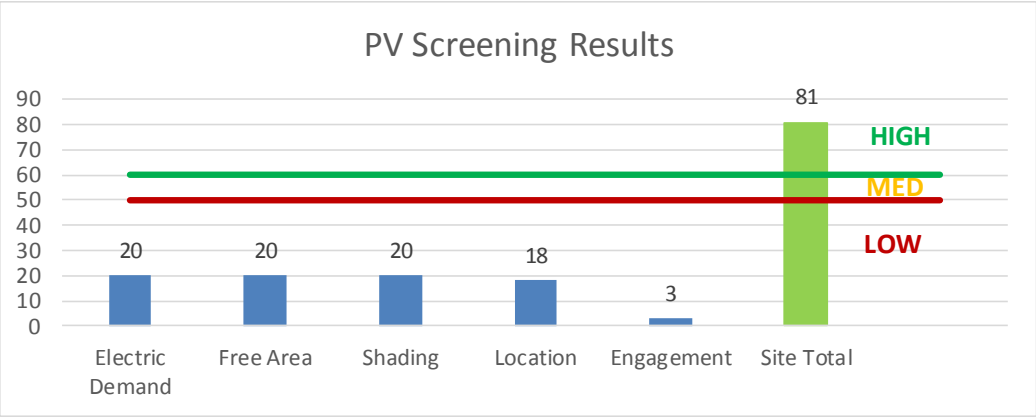
6.1 Photovoltaic

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

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

The amount of free area and the lack of shading elements contribute to the high potential for PV at the site. A PV array located primarily on the roofs of the buildings with two stories may be feasible. If Millville Public Charter School Complex is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 32 - Photovoltaic Screening



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

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

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

6.2 Combined Heat and Power

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

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

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

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

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

7 DEMAND RESPONSE

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

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

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

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

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

The first step toward participation in a DR program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (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 (www.pjm.com/training/trainingmaterial.aspx), along with a variety of other DR program information.

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

In our opinion, Demand Response is not a viable option for this facility.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 33 for a list of the eligible programs identified for each recommended ECM.

Figure 33 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x			x		
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers				x		
ECM 3	Retrofit Fixtures with LED Lamps	x			x		
ECM 4	Install LED Exit Signs				x		
ECM 5	Install Occupancy Sensor Lighting Controls	x			x		
ECM 6	Install High/Low Lighitng Controls				x		
ECM 7	Premium Efficiency Motors				x		
ECM 8	Install VFDs on Constant Volume (CV) HVAC	x			x		
ECM 9	Install High Efficiency Electric AC	x			x		
ECM 10	Install Low-Flow Domestic Hot Water Devices				x		

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

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

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

8.1 SmartStart

Overview

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

Equipment with Prescriptive Incentives Currently Available:

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

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

Incentives

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

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

How to Participate

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

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

8.2 Pay for Performance - Existing Buildings

Overview

The Pay for Performance – Existing Buildings (P4P EB) program is designed for larger customers with a peak demand over 200 kW in any of the preceding 12 months. Under this program the minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings. P4P is a generally a good option for medium to large sized facilities looking to implement as many measures as possible under a single project in order to achieve deep energy savings. This program has an added benefit of evaluating a broad spectrum of measures that may not otherwise qualify under other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also utilize the P4P program.

Incentives

Incentives are calculated based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.10/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

To participate in the P4B EB program you will need to contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, the Partner will help further evaluate the measures identified in this report through development of the Energy Reduction Plan (ERP), assist you in implementing selected measures, and verify actual savings one year after the installation. At each of these three milestones your Partner will also facilitate securing program incentives.

Approval of the final scope of work is required by the program prior to installation completion. Although installation can be accomplished by a contractor of your choice (some P4P Partners are also contractors) or by internal personnel, the Partner must remain involved to ensure compliance with the program guidelines and requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P

8.3 SREC Registration Program

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

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

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

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

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

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
Courtyard	6	High-Pressure Sodium: (1) 100W Lamp	None	138	4,380	Fixture Replacement	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	30	4,380	0.37	2,838	0.0	$494.29	$2,344.06	$600.00	3.53
Ext. Wallpack	1	LED Screw-In Lamps: LED ext wallpack	None	13	4,380	None	No	1	LED Screw-In Lamps: LED ext wallpack	None	13	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ext. Wallpack	9	Metal Halide: (1) 150W Lamp	None	190	4,380	Fixture Replacement	No	9	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	50	4,380	0.83	6,347	0.0	$1,105.28	$3,516.09	$900.00	2.37
Ext. Wallpack	11	Halogen Incandescent: Flood light	None	90	4,380	Relamp	No	11	LED Screw-In Lamps: LED Screw-in Floodlight	None	15	4,380	0.54	4,156	0.0	$723.70	$591.28	$55.00	0.74
Ext. Wallpack	2	High-Pressure Sodium: (1) 70W Lamp	None	95	4,380	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	21	4,380	0.10	745	0.0	$129.83	$781.35	$200.00	4.48
Outdoor Recessed	6	LED - Fixtures: Downlight Recessed	None	44	4,380	None	No	6	LED - Fixtures: Downlight Recessed	None	44	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ext. Wallpack	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	55	4,928	None	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	55	4,928	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Back entrance	2	LED Screw-In Lamps: Security Light	None	13	8,760	None	Yes	2	LED Screw-In Lamps: Security Light	High/Low Control	13	6,132	0.01	79	0.0	$13.68	$200.00	$0.00	14.62
Mech Room-1st floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.08	480	0.0	$83.56	$291.50	$50.00	2.89
Mech Room-2nd floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.08	480	0.0	$83.56	$291.50	$50.00	2.89
Basement	4	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.03	193	0.0	$33.66	$270.00	$35.00	6.98
Basement	5	LED Screw-In Lamps: LED interior fixture	Wall Switch	13	3,335	None	Yes	5	LED Screw-In Lamps: LED interior fixture	Occupancy Sensor	13	2,335	0.01	75	0.0	$13.02	$270.00	$35.00	18.04
Basement	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	3,335	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	40	2,335	0.04	230	0.0	$40.08	$117.00	$35.00	2.05
Basement	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Main Lobby	30	LED Screw-In Lamps: LED interior fixture	Wall Switch	13	3,335	None	No	30	LED Screw-In Lamps: LED interior fixture	Wall Switch	13	3,335	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Lobby	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,335	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,335	0.04	215	0.0	$37.40	$95.13	$20.00	2.01
Home Health	10	LED - Fixtures: Ceiling Mount	Wall Switch	40	3,335	None	Yes	10	LED - Fixtures: Ceiling Mount	Occupancy Sensor	40	2,335	0.08	460	0.0	$80.15	$540.00	$70.00	5.86
Office	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$35.09	$215.11	$0.00	6.13
Office	39	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	39	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	1.07	6,237	0.0	$1,086.24	$3,901.50	$600.00	3.04
Office	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.05	298	0.0	$51.96	$396.40	$35.00	6.95
Office	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
South Entrance	1	Compact Fluorescent: CFL screw-in interior fxiture	Wall Switch	23	3,335	Relamp	Yes	1	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	15	2,335	0.01	48	0.0	$8.35	$53.75	$35.00	2.25
Storage Room	8	Incandescent: Incan. Screw-in fixture	Wall Switch	40	3,335	Relamp	Yes	8	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	6	2,335	0.19	1,098	0.0	$191.29	$970.02	$110.00	4.50
Storage Room	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13

	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
Payroll	3	Halogen Incandescent: Halogen interior fixture	Wall Switch	50	3,335	Relamp	Yes	3	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	8	2,335	0.09	511	0.0	$88.97	$277.26	$35.00	2.72
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,335	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,335	0.05	282	0.0	$49.03	$365.13	$55.00	6.33
Restroom	2	Incandescent: Incan. Screw-in fixture	Wall Switch	40	3,335	Relamp	Yes	2	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	6	2,335	0.05	275	0.0	$47.82	$377.51	$45.00	6.95
Lower wing office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.16	960	0.0	$167.11	$621.00	$95.00	3.15
Lower wing office	13	Incandescent: Incan. Screw-in fixture	Wall Switch	40	3,335	Relamp	Yes	13	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	6	2,335	0.31	1,785	0.0	$310.85	$1,238.79	$135.00	3.55
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,335	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,335	0.04	215	0.0	$37.40	$95.13	$20.00	2.01
Stairs	1	Incandescent: Incan. Screw-in fixture	Wall Switch	40	3,335	Relamp	No	1	LED Screw-In Lamps: LED screw-in Lamp	Wall Switch	6	3,335	0.02	130	0.0	$22.71	$53.75	$5.00	2.15
Stairs	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Prez Office	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.74	4,318	0.0	$752.01	$2,929.50	$445.00	3.30
Corridor	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	2,335	0.08	448	0.0	$77.95	$389.60	$0.00	5.00
Corridor	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,335	0.57	3,359	0.0	$584.90	$1,828.50	$210.00	2.77
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.05	320	0.0	$55.70	$387.00	$20.00	6.59
Tenbook Corridor	16	Incandescent: Incan. Screw-in fixture	Wall Switch	40	3,335	Relamp	Yes	16	LED Screw-In Lamps: LED screw-in Lamp	High/Low Control	6	2,335	0.38	2,197	0.0	$382.59	$1,260.05	$80.00	3.08
Tenbook Corridor	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$35.09	$215.11	$0.00	6.13
Tenbook Office	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.15	895	0.0	$155.89	$649.20	$35.00	3.94
Tenbook Office	3	Compact Fluorescent: CFL screw-in interior fxiture	Wall Switch	23	3,335	Relamp	Yes	3	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	15	2,335	0.02	144	0.0	$25.05	$431.26	$35.00	15.82
Tenbook Office	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.19	1,120	0.0	$194.97	$679.50	$105.00	2.95
Tenbook Office	12	Linear Fluorescent - T12: 8' T12 (75W) - 1L	Wall Switch	92	3,335	Relamp & Reballast	Yes	12	LED - Linear Tubes: (1) 8' Lamp	Occupancy Sensor	36	2,335	0.53	3,074	0.0	$535.41	$2,532.00	$70.00	4.60
Corridor	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$35.09	$215.11	$0.00	6.13
Corridor	2	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	None	Yes	2	LED Screw-In Lamps: LED screw-in fixture	High/Low Control	13	2,335	0.01	30	0.0	$5.21	$0.00	$0.00	0.00
Corridor	5	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	5	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	42	2,335	0.04	242	0.0	$42.08	$200.00	$0.00	4.75
Office	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	1.23	7,197	0.0	$1,253.35	$3,606.00	$625.00	2.38
Office	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Tech Lab	7	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	7	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.06	338	0.0	$58.91	$270.00	$35.00	3.99
Kinder-3rd Grade Corridor	14	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	14	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	42	2,335	0.12	677	0.0	$117.82	$400.00	$0.00	3.39

	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
Kinder-3rd Grade Corridor	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$35.09	$215.11	$0.00	6.13
Room 3C	9	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	9	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.07	435	0.0	$75.74	$270.00	$35.00	3.10
Room 3A	8	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	8	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.07	387	0.0	$67.33	$270.00	$35.00	3.49
Room 3B	8	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	8	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.07	387	0.0	$67.33	$270.00	$35.00	3.49
Principal Office	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.02	145	0.0	$25.25	$116.00	$20.00	3.80
Room 2C	8	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	8	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.07	387	0.0	$67.33	$270.00	$35.00	3.49
Custodian	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	No	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mens Restroom	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.02	145	0.0	$25.25	$270.00	$0.00	10.69
Womens Restroom	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.02	145	0.0	$25.25	$270.00	$0.00	10.69
Tech Office	2	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.02	97	0.0	$16.83	$116.00	$20.00	5.70
Music Room	8	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	8	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.07	387	0.0	$67.33	$270.00	$35.00	3.49
Room 2B	9	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	9	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.07	435	0.0	$75.74	$270.00	$35.00	3.10
Room 1B	8	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	8	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.07	387	0.0	$67.33	$270.00	$35.00	3.49
Room 3B	9	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	9	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.07	435	0.0	$75.74	$270.00	$35.00	3.10
Room 1A	8	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	8	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.07	387	0.0	$67.33	$270.00	$35.00	3.49
Walkway	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	2,335	0.05	298	0.0	$51.96	$326.40	$0.00	6.28
Walkway	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Kindergarden	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.12	720	0.0	$125.34	$341.60	$65.00	2.21
Corridor	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Room 1D	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.25	1,439	0.0	$250.67	$721.20	$125.00	2.38
Room KC	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.41	2,399	0.0	$417.78	$1,292.00	$220.00	2.57
Main Corridor	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,335	0.33	1,919	0.0	$334.23	$801.60	$120.00	2.04
Main Corridor	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$35.09	$215.11	$0.00	6.13
Main Office	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.70	4,078	0.0	$710.23	$2,088.40	$360.00	2.43
Main Office	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.05	298	0.0	$51.96	$666.40	$70.00	11.48

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Main Office	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Room KA	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.33	1,919	0.0	$334.23	$871.60	$155.00	2.14
Room KA	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.03	149	0.0	$25.98	$333.20	$35.00	11.48
Room KD	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.37	2,159	0.0	$376.01	$946.80	$170.00	2.07
Room KD	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.03	149	0.0	$25.98	$333.20	$35.00	11.48
Mens Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.05	320	0.0	$55.70	$387.00	$20.00	6.59
Closet	1	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	None	No	1	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.03	149	0.0	$25.98	$333.20	$0.00	12.82
Womens Restroom	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.05	298	0.0	$51.96	$396.40	$0.00	7.63
Room KC2	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.33	1,919	0.0	$334.23	$871.60	$155.00	2.14
Room KC2	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.03	149	0.0	$25.98	$333.20	$35.00	11.48
Art Room	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.53	3,119	0.0	$543.12	$1,517.60	$265.00	2.31
Multipurpose	23	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	23	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.94	5,518	0.0	$960.91	$2,809.60	$485.00	2.42
Multipurpose	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$35.09	$215.11	$0.00	6.13
Corridor	10	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	None	Yes	10	LED Screw-In Lamps: LED screw-in fixture	High/Low Control	13	2,335	0.03	150	0.0	$26.05	$200.00	$0.00	7.68
Relaxation	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.33	1,919	0.0	$334.23	$1,242.00	$190.00	3.15
Stairwell	6	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	None	Yes	6	LED Screw-In Lamps: LED screw-in fixture	High/Low Control	13	2,335	0.02	90	0.0	$15.63	$200.00	$0.00	12.80
2nd Floor Main Corridor	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,335	0.11	640	0.0	$111.41	$434.00	$40.00	3.54
2nd Floor Main Corridor	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,335	0.33	1,919	0.0	$334.23	$801.60	$120.00	2.04
2nd Floor Main Corridor	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$35.09	$215.11	$0.00	6.13
2nd Floor Main Corridor	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	2,335	0.03	149	0.0	$25.98	$63.20	$0.00	2.43
2nd Floor Main Corridor	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	42	2,335	0.01	48	0.0	$8.42	$0.00	$0.00	0.00
Room 7B	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.49	2,879	0.0	$501.34	$1,442.40	$250.00	2.38
Room 6B	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.41	2,399	0.0	$417.78	$1,292.00	$220.00	2.57
Room 5C	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.03	149	0.0	$25.98	$333.20	$35.00	11.48

	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 5C	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.49	2,879	0.0	$501.34	$1,172.40	$215.00	1.91
Room 5B	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.41	2,399	0.0	$417.78	$1,292.00	$220.00	2.57
Mens Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.05	320	0.0	$55.70	$387.00	$20.00	6.59
Womens Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.05	320	0.0	$55.70	$387.00	$20.00	6.59
Custodian	1	Halogen Incandescent: Halogen interior fixture	Wall Switch	90	3,335	Relamp	No	1	LED Screw-In Lamps: LED screw-in Lamp	Wall Switch	15	3,335	0.05	288	0.0	$50.09	$53.75	$5.00	0.97
Room 5A	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.37	2,159	0.0	$376.01	$1,216.80	$205.00	2.69
Room 7A	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.41	2,399	0.0	$417.78	$1,292.00	$220.00	2.57
Room 4A	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.49	2,879	0.0	$501.34	$1,442.40	$250.00	2.38
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,335	0.02	127	0.0	$22.04	$58.50	$10.00	2.20
Room 8A	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.53	3,119	0.0	$543.12	$1,517.60	$265.00	2.31
Room 4C	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.29	1,679	0.0	$292.45	$796.40	$140.00	2.24
Room 4C	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.05	298	0.0	$51.96	$396.40	$35.00	6.95
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,335	0.08	480	0.0	$83.56	$266.40	$50.00	2.59
Auditorium	9	Incandescent: Incan. Screw-in fixture	Wall Switch	150	3,335	Relamp	Yes	9	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	23	2,335	0.79	4,622	0.0	$804.91	$753.78	$80.00	0.84
Auditorium	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	302	0.0	$52.63	$322.67	$0.00	6.13
Auditorium	10	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	15	3,335	None	Yes	10	LED Screw-In Lamps: LED screw-in fixture	Occupancy Sensor	15	2,335	0.03	173	0.0	$30.06	$270.00	$35.00	7.82
Auditorium-Stage	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	3,335	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,335	0.14	825	0.0	$143.74	$674.00	$35.00	4.45
Auditorium-Stage	2	Incandescent: Incan. Screw-in fixture	Wall Switch	65	3,335	Relamp	Yes	2	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	9	2,335	0.08	450	0.0	$78.41	$107.51	$45.00	0.80
Kitchen	3	Incandescent: Incan. Screw-in fixture	Wall Switch	65	3,335	Relamp	Yes	3	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	9	2,335	0.12	675	0.0	$117.62	$431.26	$50.00	3.24
Serving Area	20	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	20	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.51	2,984	0.0	$519.64	$2,074.00	$105.00	3.79
Serving Area	22	Halogen Incandescent: Halogen interior fixture	Wall Switch	70	3,335	Relamp	Yes	22	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	13	2,335	0.88	5,138	0.0	$894.88	$2,262.57	$250.00	2.25
Serving Area	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Closet	1	Compact Fluorescent: CFL screw-in interior fxiture	Wall Switch	23	3,335	Relamp	No	1	LED Screw-In Lamps: LED screw-in Lamp	Wall Switch	15	3,335	0.01	31	0.0	$5.34	$53.75	$0.00	10.06
Restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,335	0.09	506	0.0	$88.17	$234.00	$40.00	2.20
Kitchen	10	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	11	3,335	None	Yes	10	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	11	2,335	0.02	127	0.0	$22.04	$270.00	$35.00	10.66

	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
Kitchen	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Admin Corridor	6	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	None	Yes	6	LED Screw-In Lamps: LED screw-in fixture	High/Low Control	13	2,335	0.02	90	0.0	$15.63	$200.00	$0.00	12.80
Admin Corridor	3	Compact Fluorescent: CFL screw-in interior fxiture	Wall Switch	23	3,335	Relamp	Yes	3	LED Screw-In Lamps: LED screw-in Lamp	High/Low Control	15	2,335	0.02	144	0.0	$25.05	$361.26	$0.00	14.42
Lease Office	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	11	3,335	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	11	2,335	0.01	51	0.0	$8.82	$116.00	$20.00	10.89
Lease Office	1	Incandescent: Incan. Screw-in fixture	Wall Switch	65	3,335	Relamp	Yes	1	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	9	2,335	0.04	225	0.0	$39.21	$169.75	$25.00	3.69
Lease Office	2	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	3,335	Relamp	Yes	2	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,335	0.02	123	0.0	$21.44	$63.80	$30.00	1.58
Business Office	9	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	11	3,335	None	Yes	9	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	11	2,335	0.02	114	0.0	$19.84	$270.00	$35.00	11.85
Business Office	2	Compact Fluorescent: CFL screw-in interior fxiture	Wall Switch	23	3,335	Relamp	Yes	2	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	15	2,335	0.02	96	0.0	$16.70	$223.51	$20.00	12.19
Business Office	2	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	3,335	Relamp	Yes	2	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,335	0.02	123	0.0	$21.44	$63.80	$30.00	1.58
Insurance Agency Office	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	11	3,335	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	11	2,335	0.01	51	0.0	$8.82	$116.00	$20.00	10.89
Insurance Agency Office	2	Compact Fluorescent: CFL screw-in interior fxiture	Wall Switch	23	3,335	Relamp	Yes	2	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	15	2,335	0.02	96	0.0	$16.70	$223.51	$20.00	12.19
Insurance Agency Office	2	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	3,335	Relamp	Yes	2	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,335	0.02	123	0.0	$21.44	$63.80	$30.00	1.58
Runners Admin	13	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	13	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,335	0.33	1,939	0.0	$337.77	$1,091.60	$35.00	3.13
Runners Admin	3	Incandescent: Incan. Screw-in fixture	Wall Switch	65	3,335	Relamp	Yes	3	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	9	2,335	0.12	675	0.0	$117.62	$431.26	$50.00	3.24
Runners Admin	2	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	3,335	Relamp	Yes	2	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,335	0.02	123	0.0	$21.44	$333.80	$45.00	13.47
Basement	7	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	None	Yes	7	LED Screw-In Lamps: LED screw-in fixture	Occupancy Sensor	13	2,335	0.02	105	0.0	$18.23	$270.00	$35.00	12.89
Basement	4	Compact Fluorescent: CFL screw-in interior fxiture	Wall Switch	23	3,335	Relamp	Yes	4	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	15	2,335	0.03	192	0.0	$33.40	$485.01	$35.00	13.47
Basement	4	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	42	3,335	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	42	2,335	0.03	193	0.0	$33.66	$270.00	$35.00	6.98
Basement	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.14	800	0.0	$139.26	$562.50	$85.00	3.43
Basement	3	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	3,335	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,335	0.21	1,238	0.0	$215.61	$876.00	$35.00	3.90
Basement	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	302	0.0	$52.63	$322.67	$0.00	6.13
Storage	35	Halogen Incandescent: Halogen interior fixture	Wall Switch	65	3,335	Relamp	Yes	35	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	9	2,335	1.35	7,880	0.0	$1,372.24	$3,501.36	$385.00	2.27
Storage	5	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	None	Yes	5	LED Screw-In Lamps: LED screw-in fixture	Occupancy Sensor	13	2,335	0.01	75	0.0	$13.02	$116.00	$0.00	8.91
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,335	0.06	380	0.0	$66.12	$150.40	$30.00	1.82
Unoccupied Wing	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,335	0.33	1,919	0.0	$334.23	$1,242.00	$190.00	3.15

	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
Unoccupied Wing	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	302	0.0	$52.63	$322.67	$0.00	6.13
Entryway	2	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	None	Yes	2	LED Screw-In Lamps: LED screw-in fixture	High/Low Control	13	2,335	0.01	30	0.0	$5.21	$0.00	$0.00	0.00
Entryway	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$17.54	$107.56	$0.00	6.13
Entryway	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,335	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,335	0.12	720	0.0	$125.34	$425.60	$45.00	3.04
Manager Office	1	LED Screw-In Lamps: LED screw-in fixture	Wall Switch	13	3,335	None	Yes	1	LED Screw-In Lamps: LED screw-in fixture	Occupancy Sensor	13	2,335	0.00	15	0.0	$2.60	$116.00	$20.00	36.85
Manager Office	3	Halogen Incandescent: Halogen interior fixture	Wall Switch	65	3,335	Relamp	Yes	3	LED Screw-In Lamps: LED screw-in Lamp	Occupancy Sensor	9	2,335	0.12	675	0.0	$117.62	$277.26	$35.00	2.06
Restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,335	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,335	0.02	111	0.0	$19.37	$63.20	$0.00	3.26

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Restroom	1	Exhaust Fan	0.3	78.0%	No	3,020	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Restroom	1	Exhaust Fan	0.3	78.0%	No	3,020	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Restroom	1	Exhaust Fan	0.3	69.5%	No	3,020	No	69.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Kitchen	1	Kitchen Hood Exhaust Fan	0.5	78.2%	No	5,250	No	78.2%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Kitchen	1	Kitchen Hood Exhaust Fan	1.0	82.5%	No	5,250	No	82.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mech Room 1st Floor	AHU	2	Supply Fan	7.5	88.5%	No	3,391	Yes	91.0%	Yes	2	2.17	8,301	0.0	$1,445.60	$9,476.48	$1,200.00	5.73
Mech Room 2nd Floor	AHU	2	Supply Fan	7.5	88.5%	No	3,391	Yes	91.0%	Yes	2	2.17	8,301	0.0	$1,445.60	$9,476.48	$1,200.00	5.73
Basement	AHU 2-Living Quarters	1	Supply Fan	5.0	87.5%	No	3,020	Yes	89.5%	Yes	1	0.72	2,459	0.0	$428.29	$4,076.22	$400.00	8.58
Basement	AHU 1-Accounting	1	Supply Fan	5.0	84.0%	No	3,020	Yes	89.5%	Yes	1	0.81	2,821	0.0	$491.34	$4,076.22	$400.00	7.48
Basement	Heating Hot Water	1	Heating Hot Water Pump	0.1	60.0%	No	3,020	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement	Accounting	1	Supply Fan	2.0	84.0%	No	3,020	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Elevator Room	Elevator Room	1	Process Pump	25.0	75.5%	No	500	No	75.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	Kitchen	1	Supply Fan	3.0	86.5%	No	3,020	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Auditorium	Carrier AHU	2	Supply Fan	3.0	86.5%	No	3,020	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	AOU30RLX	2	Supply Fan	0.1	60.0%	No	3,020	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Offices	PTH153	1	Supply Fan	0.1	60.0%	No	3,020	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Offices	PTH153	4	Supply Fan	0.1	60.0%	No	3,020	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	MUZ-D36	1	Supply Fan	0.1	60.0%	No	3,020	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	DH078N15A	4	Supply Fan	1.5	86.5%	No	3,020	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	ZJ037	1	Supply Fan	1.5	86.5%	No	3,020	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	DF090N15	4	Supply Fan	3.0	89.5%	No	3,020	No	89.5%	Yes	4	1.62	5,436	0.0	$946.75	$12,030.60	$960.00	11.69
Roof	XP060C	2	Supply Fan	1.5	86.5%	No	3,020	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	BP180E36A	1	Supply Fan	5.0	87.5%	No	3,020	Yes	89.5%	Yes	1	0.72	2,459	0.0	$428.29	$4,196.91	$400.00	8.87
Roof	ZE036C	2	Supply Fan	1.5	86.5%	No	3,020	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	PUYA12	1	Supply Fan	0.0	60.0%	No	3,020	No	60.0%	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
Ground Floor	Offices	1	Split-System AC	18.00		Yes	1	Split-System AC	18.00		11.50		No	4.44	7,498	0.0	$1,305.73	$20,877.27	$1,422.00	14.90
Ground Floor	Offices	2	Ductless Mini-Split AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Offices	Offices	1	Packaged Terminal AC	1.16		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Offices	Offices	4	Packaged Terminal AC	1.16		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	Kitchen	1	Window AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Offices	Offices	7	Window AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Insurance	Insurance	1	Window AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	Offices	1	Ductless Mini-Split AC	2.75		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Various	4	Packaged AC	6.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Various	1	Packaged AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Various	4	Packaged AC	7.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Various	4	Split-System AC	3.00		Yes	4	Split-System AC	3.00		14.00		No	2.76	4,653	0.0	$810.38	$17,954.64	$1,104.00	20.79
Ground Floor	Offices	2	Split-System AC	7.50		Yes	2	Split-System AC	7.50		11.50		No	4.59	7,745	0.0	$1,348.80	$17,456.55	$1,095.00	12.13
Roof	Various	2	Packaged AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Various	1	Packaged Air-Source HP	15.00	172.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Various	2	Packaged AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Various	2	Split-System AC	30.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	Elevator room	1	Ductless Mini-Split AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	Offices	1	Split-System AC	10.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	Various	1	Electric Resistance Heat		122.83	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Offices	Offices	5	Electric Resistance Heat		11.94	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Office	Main Office	1	Electric Resistance Heat		6.14	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Office	Main Office	1	Electric Resistance Heat		3.07	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
Basement	Offices	2	Condensing Hot Water Boiler	414.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	DH078N15A and DF090N15 Package units	8	Furnace	144.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	XJ037N09	1	Furnace	96.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

DHW Inventory & Recommendations

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

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	13	Faucet Aerator (Lavatory)	2.20	1.00	0.00	4,148	0.0	$722.41	$93.21	$0.00	0.13

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 (>50 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Refrigerator, Solid Door (>50 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Freezer, Solid Door (>50 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Cooking Equipment Inventory & Recommendations

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

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Multiple Locations	121	Computers	105.0	Yes
Multiple Locations	13	Printer	74.0	Yes
Multiple Locations	11	Copy Machine	425.0	Yes
Multiple Locations	7	Microwave	700.0	No
Multiple Locations	5	Coffee Machine	780.0	No
Multiple Locations	5	Toaster	800.0	No
Multiple Locations	6	Refrigerator	430.0	No
Multiple Locations	3	Water Cooler	350.0	No
Multiple Locations	3	Dehumidifier	530.0	Yes
Multiple Locations	2	small freezer	125.0	No
Kitchen	1	Washer-Dryer Combo	1,000.0	No

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

N/A

ENERGY STAR® Score[1]

Millville Public Charter School Complex

Primary Property Type: K-12 School
Gross Floor Area (ft²): 67,000
Built: 1950

For Year Ending: January 31, 2018
Date Generated: June 11, 2018

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Millville Public Charter School Complex 1101 Wheaton Avenue Millville, New Jersey 08332	Millville Public Charter School 1101 Wheaton Avenue Millville, NJ 08332 (____)____-_____	Douglas McGarry 1101 Wheaton Avenue Millville, NJ 08332 856-691-1611 dmcgarry@ccharters.org

Property ID: 6376961

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
66.3 kBtu/ft²

Source EUI
170.5 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	3,234,312 (73%)
Natural Gas (kBtu)	1,206,021 (27%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	55
National Median Source EUI (kBtu/ft²)	141.4
% Diff from National Median Source EUI	20%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	423

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

____ _____
.
(____)____-_____
_____

Professional Engineer Stamp (if applicable)