Local Government Energy Audit:
Energy Audit Report

Village Charter School

101 Sullivan Way

Trenton, New Jersey 08628

Village Charter School

November 14, 2018

Final Report by:

TRC Energy Services

Disclaimer

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

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

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

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

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1 EXECUTIVE SUMMARY

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

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

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

1.1 Facility Summary

Village Charter School is a 47,000 square foot facility comprised of various space types such as classrooms, offices, hallways, gymnasium, kitchen, storage closets and a mechanical space. This is a three-story facility. The school operates on the weekdays from 7:00 AM to 10:00 PM and approximately one weekend per month.

The building was built in 1999. Space heating is provided using four gas-fired non-condensing hot water boilers and furnaces (inside the packaged units). Space cooling is provided various split unit systems and a couple of packaged terminal AC units in some spaces. Lighting includes linear fluorescent T8, compact fluorescent lamps, incandescent lamps, metal halide fixtures, and LED fixtures in a few spaces. A thorough description of the facility and our observations are in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated eight measures and recommends five of them which together represent an opportunity to reduce annual energy costs by $13,953 and annual greenhouse gas emissions by 94,404 lbs. CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 4.2 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 Village Charter School's annual energy use by 12%.

Figure 1 – Previous 12 Month Utility Costs

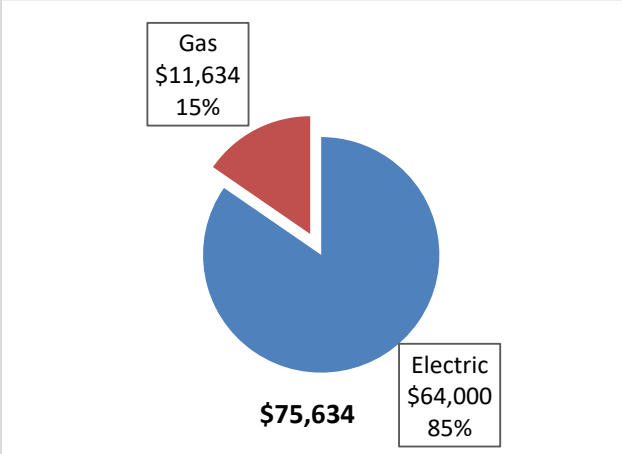
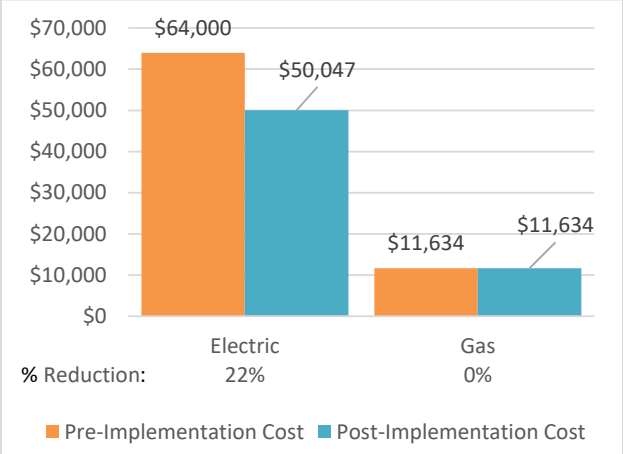


Figure 2 – Potential Post-Implementation Costs



A detailed description of Village Charter School's existing energy use can be found in Section 3.

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

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**72,160**	**14.8**	**0.0**	**$10,740.03**	**$41,546.59**	**$6,465.00**	**$35,081.59**	**3.3**	**72,664**
ECM 1	Install LED Fixtures	Yes	3,590	0.7	0.0	$534.29	$12,682.47	$200.00	$12,482.47	23.4	3,615
ECM 2	Retrofit Fixtures with LED Lamps	Yes	68,570	14.1	0.0	$10,205.74	$28,864.12	$6,265.00	$22,599.12	2.2	69,049
Lighting Control Measures			**15,617**	**3.2**	**0.0**	**$2,324.40**	**$18,866.00**	**$2,035.00**	**$16,831.00**	**7.2**	**15,726**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	12,566	2.6	0.0	$1,870.30	$12,266.00	$2,035.00	$10,231.00	5.5	12,654
ECM 4	Install High/Low Lighitng Controls	Yes	3,051	0.6	0.0	$454.11	$6,600.00	$0.00	$6,600.00	14.5	3,072
Variable Frequency Drive (VFD) Measures			**5,972**	**0.8**	**0.0**	**$888.81**	**$6,015.30**	**$0.00**	**$6,015.30**	**6.8**	**6,013**
ECM 5	Install VFDs on Hot Water Pumps	Yes	5,972	0.8	0.0	$888.81	$6,015.30	$0.00	$6,015.30	6.8	6,013
Electric Unitary HVAC Measures			**21,822**	**12.7**	**0.0**	**$3,247.92**	**$113,720.34**	**$6,942.50**	**$106,777.84**	**32.9**	**21,975**
	Install High Efficiency Electric AC	No	21,547	12.5	0.0	$3,207.02	$109,890.72	$6,812.50	$103,078.22	32.1	21,698
	Install High Efficiency Packaged Terminal AC/HP	No	275	0.2	0.0	$40.90	$3,829.62	$130.00	$3,699.62	90.4	277
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**35.2**	**$332.21**	**$42,178.23**	**$3,290.00**	**$38,888.23**	**117.1**	**4,123**
	Install High Efficiency Hot Water Boilers	No	0	0.0	35.2	$332.21	$42,178.23	$3,290.00	$38,888.23	117.1	4,123
TOTALS FOR HIGH PRIORITY MEASURES			**93,749**	**18.8**	**0.0**	**$13,953.24**	**$66,427.89**	**$8,500.00**	**$57,927.89**	**4.2**	**94,404**
TOTALS FOR ALL EVALUATED MEASURES			**115,571**	**31.5**	**35.2**	**$17,533.38**	**$222,326.46**	**$18,732.50**	**$203,593.96**	**11.6**	**120,501**

* - 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.

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.

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

Energy Efficient Practices

TRC also identified five 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 Village Charter School include:

- Use Thermostat Schedules and Temperature Resets
- Perform Regular Furnace Maintenance
- Perform Regular Water Heater Maintenance
- Install Plug Load Controls
- Water Conservation

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

On-Site Generation Measures

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

Figure 4 – Photovoltaic Potential

Potential	High	
System Potential	129	kW DC STC
Electric Generation	153,687	kWh/yr
Displaced Cost	$13,370	/yr
Installed Cost	$335,400	

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

1.3 Implementation Planning

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

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

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

- SmartStart
- Direct Install
- Pay for Performance - Existing Building (P4P EB)
- SREC (Solar Renewable Energy Certificate) Registration Program (SRP)
- Energy Savings Improvement Program (ESIP)

For facilities wanting to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate in this program, you may utilize internal resources, or an outside firm or contractor, to do the final design of the ECM(s) and do the installation. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation. The incentive estimates listed above in Figure 3 are based on the SmartStart program. More details on this program and others are available in Section 8.

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.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services as well as attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.5 for additional information on the ESIP Program. The Project does not meet the 15% threshold with less than 50% from lighting, so additional measures would be required to participate in this program.

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			
Paul Dewitt	Business Admin	pdewitt@villagecharter.org	609-695-0110 Extn:116
TRC Energy Services			
Alex Klieverik	Auditor	aklieverik@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On June 19, 2018, TRC performed an energy audit at Village Charter School located in Trenton, New Jersey. TRC's team met with Neil Blitz to review the facility operations and help focus our investigation on specific energy-using systems.

Village Charter School is a 47,000 square foot facility comprised of various space types such as classrooms, offices, hallways, gymnasium, kitchen, storage closets and a mechanical space. This is a three-story facility. The building was built in 1999.

Space heating in the building is provided using four gas-fired non-condensing hot water boilers and furnaces (inside the packaged units). Space cooling is provided by various split unit systems and a couple of packaged terminal AC units in some spaces. Lighting includes linear fluorescent T8, compact fluorescent lamps, incandescent lamps, metal halide fixtures, and LED fixtures in a few spaces.

2.3 Building Occupancy

The typical schedule is presented in the table below. During a typical day, the facility is occupied by approximately 420 people including the staff and students. The school operates on the weekdays from 7:00 AM to 10:00 PM and approximately one weekend per month.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Village Charter School	Weekday	7AM - 10PM
Village Charter School	Weekend	One weekend per month

2.4 Building Envelope

The building is constructed of concrete block and structural steel with a stone and concrete facade. The buildings have pitched roofs covered with asphalt shingles that are in good condition. The buildings have double pane windows which are in good condition and show little sign of excessive infiltration. The exterior doors are constructed of aluminum framed glass doors and in good condition.

Image 1 Building Envelope

2.5 On-Site Generation

Village Charter School does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

Please see Appendix A: Equipment Inventory & Recommendations for full equipment inventory.

Lighting System

Lighting at the facility is provided mostly by 32-Watt linear fluorescent T8 lamps, U-bent tubes with electronic ballasts as well as some incandescent lamps, compact fluorescent lamps (CFL) and some LED lamp fixtures. Most of the fixtures are 2- or 3-lamp, 4-foot long troffers or 2-foot u-bent fixtures. Lighting control in most spaces is provided by manual wall switches.

Exterior lighting is minimal and consists of 50-, 100- or 150-Watt metal halide fixtures and compact fluorescent fixtures. The exterior light fixtures are controlled by timers.

Image 2 Typical Lighting Fixtures

Hot Water (or Steam) Heating System

The hot water system consists of four gas-fired non-condensing Weil McLain hot water boilers. Three of these boilers have an output capacity of 346 MBh and one has an output capacity of 842 MBh. The boilers have a nominal combustion efficiency of 80%. Heating hot water from the boilers is circulated throughout the facility to radiators and unit ventilators using two 3 hp constant speed pumps.

RTU 1 (Trane) and RTU 2 (AAON) packaged units have burners with an output capacity of 95 MBh and an 80% efficiency. Hot water is supplied at 180°F when the outside air temperature is below 55°F and the setpoint is reset to 155°F when the outside air is above 65°F.

The three smaller boilers were installed in 1999 and the larger boiler in 2003. All boilers have been evaluated for replacement.

Image 3 Hot water heating system

Direct Expansion Air Conditioning System (DX)

Space cooling is provided by multiple split AC units whose capacity range from 2 tons – 10 tons. The Principal's office and another space is cooled using a 1-ton packaged terminal unit. Most of these units were installed in 1999 and 2003 during the construction of the building and subsequent renovation.

The IT room has a dedicated 2-ton split AC unit from Sanyo. This unit was installed in 2007.

All units above 15 years were evaluated for replacement.

Image 4 DX cooling system

Domestic Hot Water Heating System

The domestic hot water heating system consists of one 80-gallon, gas-fired hot water heater (Bradford White) with an input capacity of 250 MBh. The system efficiency is 80%. The domestic hot water heater is six years old, in good condition and well maintained.

Image 5 Domestic Hot Water Heating System

Food Service & Refrigeration

The school has a commercial kitchen used to prepare lunches for the students. The kitchen equipment includes convection oven, gas ranges, gas steamer, insulating food holding cabinet. There is one reach-in refrigerator, one walk-in refrigerator and one walk-in freezer.

Building Plug Load

There are roughly 78 computer work stations throughout the facility. Other plug loads at the school include printers, television, laptops, refrigerators, microwave oven, projectors, shredders, and laptop carts. There is no centralized PC power management software installed.

2.7 Water-Using Systems

The restroom faucets are rated for 2.2 gallons per minute (gpm) or lower, the toilets are rated at 1.6 gallons per flush (gpf) and the urinals are rated at 1 gpf.

3 SITE ENERGY USE AND COSTS

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

3.1 Total Cost of Energy

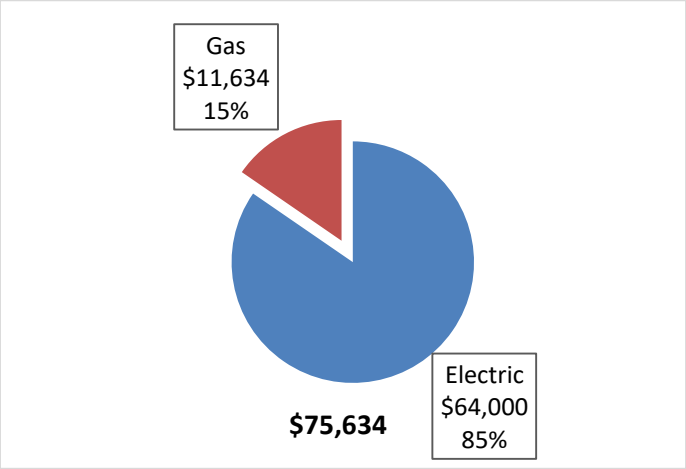
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Village Charter School		
Fuel	**Usage**	**Cost**
Electricity	430,003 kWh	$64,000
Natural Gas	12,331 Therms	$11,634
Total		**$75,634**

The current annual energy cost for this facility is $75,634 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by PSE&G. The average electric cost over the past 12 months was $0.149/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 third-party electric supply is provided by Direct Energy. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 9 - Electric Usage & Demand

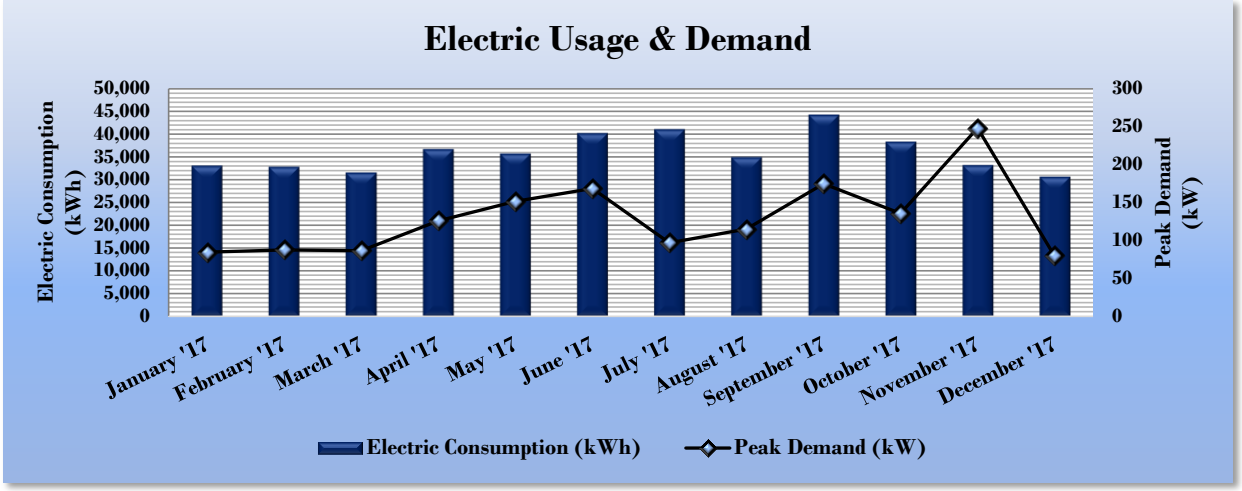


Figure 10 - Electric Usage & Demand

Electric Billing Data for Village Charter School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
1/31/17	30	32,944	85	$314	$4,312
3/2/17	30	32,719	87	$325	$4,380
3/31/17	29	31,439	86	$325	$4,236
5/2/17	32	36,589	126	$474	$4,966
6/1/17	30	35,619	151	$570	$4,945
6/30/17	29	40,106	168	$634	$7,145
8/1/17	32	40,920	97	$364	$6,327
8/30/17	29	34,836	115	$432	$5,855
9/29/17	30	44,124	175	$668	$7,728
10/30/17	31	38,236	136	$519	$5,542
11/30/17	31	33,077	248	$949	$4,541
1/2/18	33	30,572	80	$305	$4,200
Totals	**366**	**431,181**	**248**	**$5,881**	**$64,176**
Annual	**365**	**430,003**	**248**	**$5,865**	**$64,000**

3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is $0.943/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below. The energy use profile for natural gas is typical for a gas heated building with a small service water load in a temperate climate.

Figure 11 - Natural Gas Usage

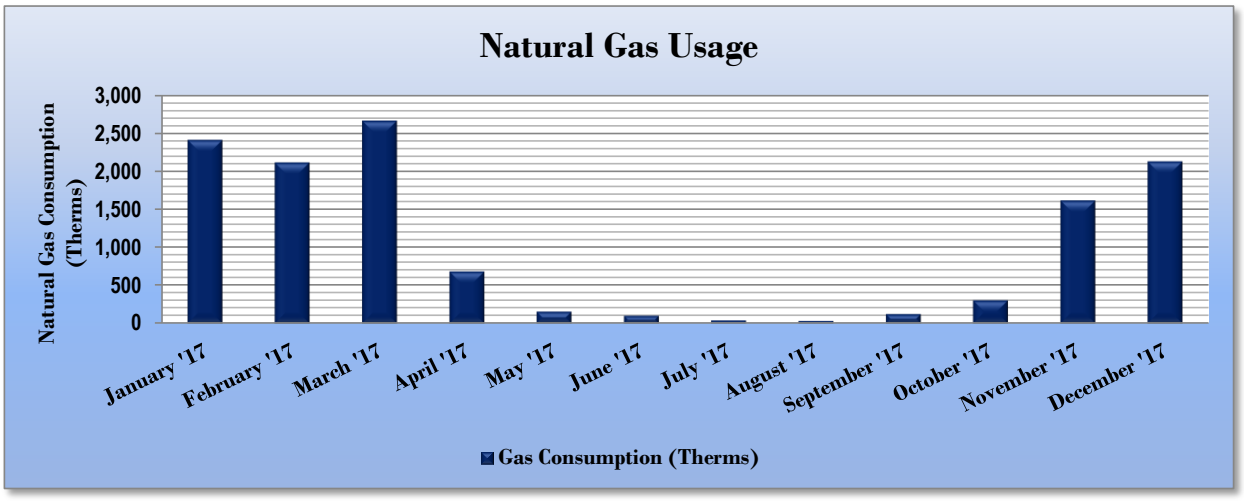


Figure 12 - Natural Gas Usage

Gas Billing Data for Village Charter School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
1/31/17	30	2,411	$2,443
3/2/17	30	2,116	$2,070
3/31/17	29	2,665	$2,156
5/2/17	32	683	$501
6/1/17	30	154	$195
6/30/17	29	98	$165
8/1/17	32	37	$128
8/30/17	29	31	$124
9/29/17	30	122	$175
10/30/17	31	301	$274
12/1/17	32	1,618	$1,519
1/2/18	32	2,129	$1,914
Totals	**366**	**12,364**	**$11,666**
Annual	**365**	**12,331**	**$11,634**

3.4 Benchmarking

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

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

Figure 13 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Village Charter School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	125.6	141.4
Site Energy Use Intensity (kBtu/ft^2)	57.5	58.2

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

Figure 14 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Village Charter School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	104.2	141.4
Site Energy Use Intensity (kBtu/ft^2)	50.6	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 69.

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

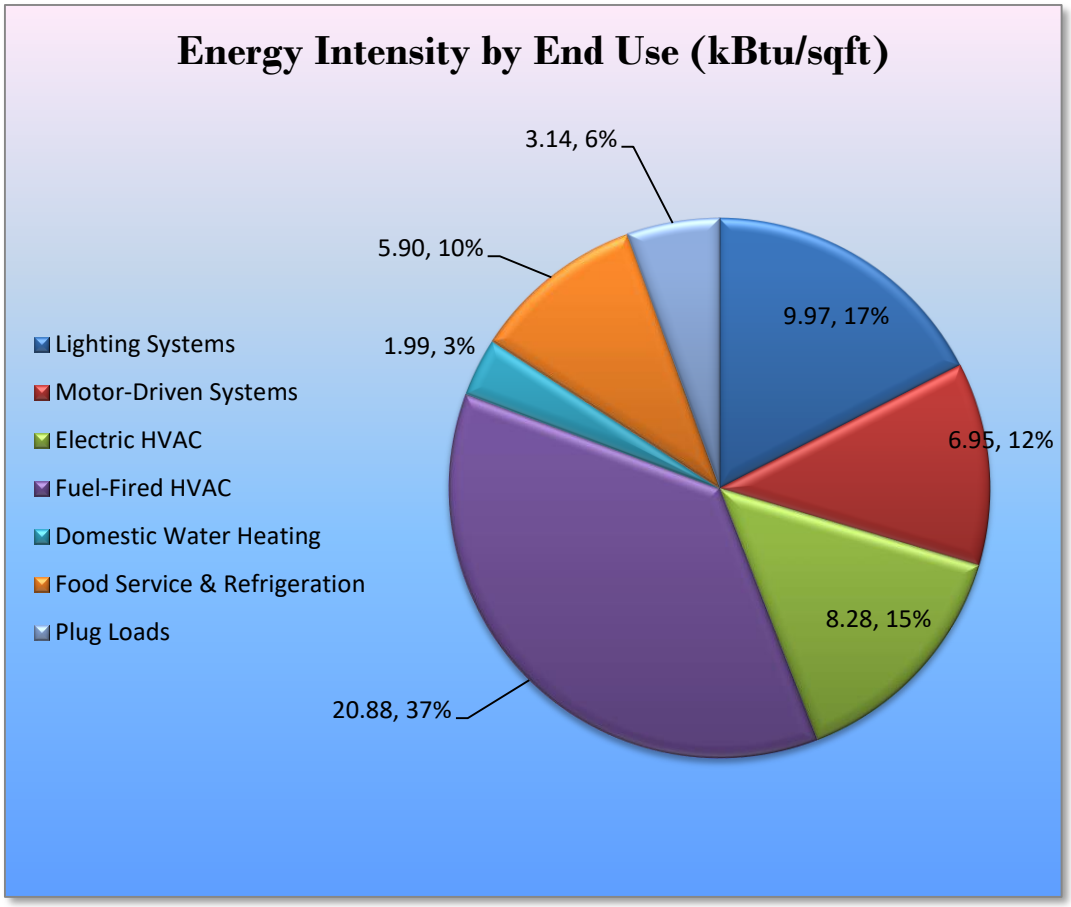
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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 15 - Energy Balance (% and kBtu/SF)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

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

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 16 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**72,160**	**14.8**	**0.0**	**$10,740.03**	**$41,546.59**	**$6,465.00**	**$35,081.59**	**3.3**	**72,664**
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ECM 2	Retrofit Fixtures with LED Lamps	68,570	14.1	0.0	$10,205.74	$28,864.12	$6,265.00	$22,599.12	2.2	69,049
Lighting Control Measures		**15,617**	**3.2**	**0.0**	**$2,324.40**	**$18,866.00**	**$2,035.00**	**$16,831.00**	**7.2**	**15,726**
ECM 3	Install Occupancy Sensor Lighting Controls	12,566	2.6	0.0	$1,870.30	$12,266.00	$2,035.00	$10,231.00	5.5	12,654
ECM 4	Install High/Low Lighitng Controls	3,051	0.6	0.0	$454.11	$6,600.00	$0.00	$6,600.00	14.5	3,072
Variable Frequency Drive (VFD) Measures		**5,972**	**0.8**	**0.0**	**$888.81**	**$6,015.30**	**$0.00**	**$6,015.30**	**6.8**	**6,013**
ECM 5	Install VFDs on Hot Water Pumps	5,972	0.8	0.0	$888.81	$6,015.30	$0.00	$6,015.30	6.8	6,013
TOTALS		**93,749**	**18.8**	**0.0**	**$13,953.24**	**$66,427.89**	**$8,500.00**	**$57,927.89**	**4.2**	**94,404**

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

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

4.1.1 Lighting Upgrades

Our recommendations for upgrades to existing lighting fixtures are summarized in Figure 17 below.

Figure 17 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**72,160**	**14.8**	**0.0**	**$10,740.03**	**$41,546.59**	**$6,465.00**	**$35,081.59**	**3.3**	**72,664**
ECM 1	Install LED Fixtures	3,590	0.7	0.0	$534.29	$12,682.47	$200.00	$12,482.47	23.4	3,615
ECM 2	Retrofit Fixtures with LED Lamps	68,570	14.1	0.0	$10,205.74	$28,864.12	$6,265.00	$22,599.12	2.2	69,049

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	3,590	0.7	0.0	$534.29	$12,682.47	$200.00	$12,482.47	23.4	3,615

Measure Description

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

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

ECM 2: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	68,480	14.1	0.0	$10,192.36	$28,760.77	$6,265.00	$22,495.77	2.2	68,959
Exterior	90	0.0	0.0	$13.38	$103.35	$0.00	$103.35	7.7	91

Measure Description

We recommend retrofitting existing incandescent linear T8 tubes or other 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 more than 10 times longer than many incandescent lamps.

4.1.2 Lighting Control Measures

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

Figure 18 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**15,617**	**3.2**	**0.0**	**$2,324.40**	**$18,866.00**	**$2,035.00**	**$16,831.00**	**7.2**	**15,726**
ECM 3	Install Occupancy Sensor Lighting Controls	12,566	2.6	0.0	$1,870.30	$12,266.00	$2,035.00	$10,231.00	5.5	12,654
ECM 4	Install High/Low Lighitng Controls	3,051	0.6	0.0	$454.11	$6,600.00	$0.00	$6,600.00	14.5	3,072

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 3: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
12,566	2.6	0.0	$1,870.30	$12,266.00	$2,035.00	$10,231.00	5.5	12,654

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in restrooms, storage rooms, classrooms and offices areas. 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 4: Install High/Low Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
3,051	0.6	0.0	$454.11	$6,600.00	$0.00	$6,600.00	14.5	3,072

Measure Description

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

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

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

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

4.1.3 Variable Frequency Drive Measures

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

Figure 19 – Summary of Variable Frequency Drive ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**5,972**	**0.8**	**0.0**	**$888.81**	**$6,015.30**	**$0.00**	**$6,015.30**	**6.8**	**6,013**
ECM 5	Install VFDs on Hot Water Pumps	5,972	0.8	0.0	$888.81	$6,015.30	$0.00	$6,015.30	6.8	6,013

ECM 5: Install VFDs on Hot Water Pumps

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
5,972	0.8	0.0	$888.81	$6,015.30	$0.00	$6,015.30	6.8	6,013

Measure Description

We recommend installing a variable frequency drives (VFD) to control two 3 hp hot water pumps. This measure requires that a majority of the hot water coils be served by 2-way valves and that a differential pressure sensor is installed in the hot water loop. As the hot water valves close, the differential pressure increases. The VFD modulates pump speed to maintain a differential pressure setpoint. Energy savings results from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

4.2 ECMs Evaluated but Not Recommended

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

Figure 20 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures	**21,822**	**12.7**	**0.0**	**$3,247.92**	**$113,720.34**	**$6,942.50**	**$106,777.84**	**32.9**	**21,975**
Install High Efficiency Electric AC	21,547	12.5	0.0	$3,207.02	$109,890.72	$6,812.50	$103,078.22	32.1	21,698
Install High Efficiency Packaged Terminal AC/HP	275	0.2	0.0	$40.90	$3,829.62	$130.00	$3,699.62	90.4	277
Gas Heating (HVAC/Process) Replacement	**0**	**0.0**	**35.2**	**$332.21**	**$42,178.23**	**$3,290.00**	**$38,888.23**	**117.1**	**4,123**
Install High Efficiency Hot Water Boilers	0	0.0	35.2	$332.21	$42,178.23	$3,290.00	$38,888.23	117.1	4,123
TOTALS	**21,822**	**12.7**	**35.2**	**$3,580.14**	**$155,898.57**	**$10,232.50**	**$145,666.07**	**40.7**	**26,097**

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

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

Install High Efficiency Air Conditioning Units

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
21,547	12.5	0.0	$3,207.02	$109,890.72	$6,812.50	$103,078.22	32.1	21,698

Measure Description

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

Install High Efficiency PTAC/PTHP

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)
275	0.2	0.0	$40.90	$3,829.62	$130.00	$3,699.62	90.4	277

Measure Description

We evaluated replacing packaged terminal air conditioners and heat pumps (PTAC and PTHP) with high efficiency PTAC and PTHP. 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 and a higher HPSF rating indicates more efficient heating mode for heat pumps. 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 heating and cooling loads, and the estimated annual operating hours.

Install High Efficiency Hot Water Boilers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	35.2	$332.21	$42,178.23	$3,290.00	$38,888.23	117.1	4,123

Measure Description

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

The most notable efficiency improvement is condensing hydronic boilers that can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies between 85% and 87% (comparable to other high efficiency boilers) when the return water temperature is above 130°F. The boiler efficiency increases as the return water temperature drops below 130°F. Therefore, condensing hydronic boilers were only evaluated when the return water temperature is less than 130°F during most of the operating hours. As a result, condensing hydronic boilers are not recommended for this site.

Reasons for not Recommending

Although the evaluated equipment is old enough to be replaced, the cost associated with the investment is not justified by the pay-back period. When this equipment is due for replacement, we suggest that they be replaced with a high efficiency equipment at the time.

5 ENERGY EFFICIENT PRACTICES

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

Use Thermostat Schedules and Temperature Resets

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

Perform Regular Furnace Maintenance

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

Perform Regular 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.

Plug Load Controls

There are a variety of ways to limit the energy use of plug loads including increasing occupant awareness, removing under-utilized equipment, installing hardware controls, and using software controls. Some control steps to take are to enable the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips. For additional information refer to "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

Water Conservation

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

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

6 On-Site Generation Measures

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

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

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

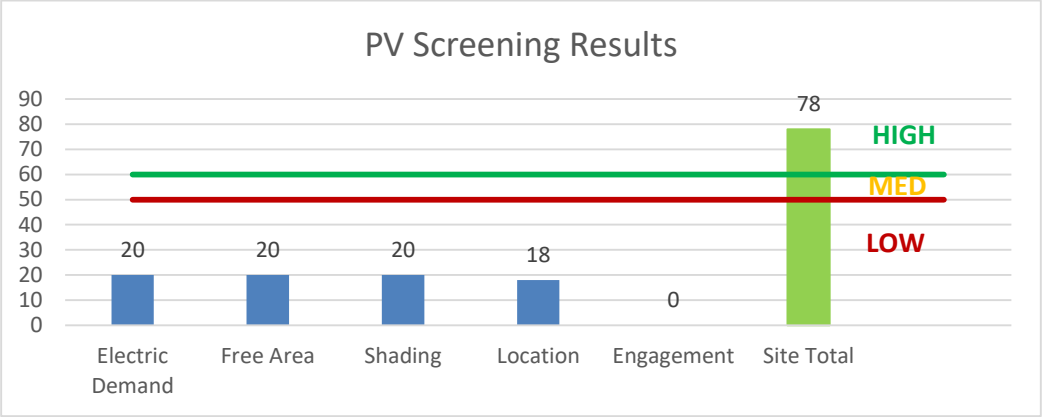
6.1 Photovoltaic

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

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

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

Figure 21 - Photovoltaic Screening



Potential	High	
System Potential	129	kW DC STC
Electric Generation	153,687	kWh/yr
Displaced Cost	$13,370	/yr
Installed Cost	$335,400	

Solar projects must register their projects in the SREC (Solar Renewable Energy Certificate) Registration Program (SRP) prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about developed new solar projects and insight into future SREC pricing. Refer to Section 8.4 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.

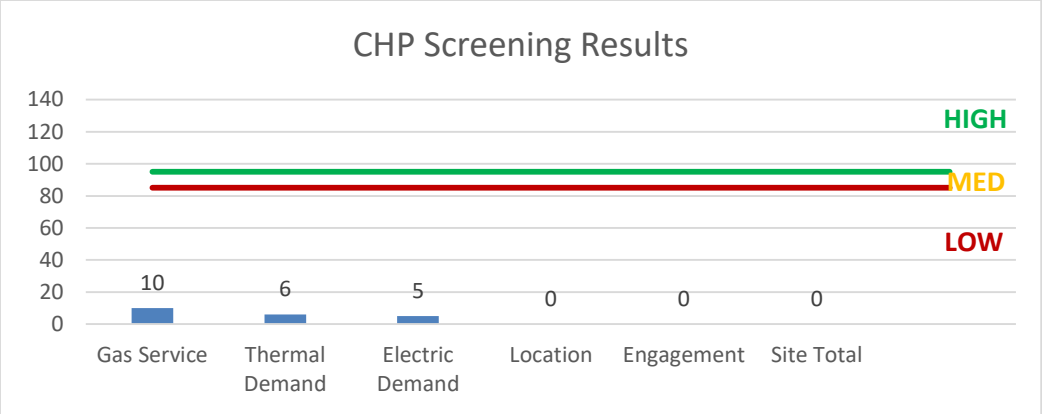
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste 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 or infrequent thermal load, and lack of space near the existing boilers are the most significant factors contributing to the potential for CHP at the site. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

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

Figure 22 - Combined Heat and Power Screening



7 DEMAND RESPONSE

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

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

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

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

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

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

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

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 23 for a list of the eligible programs identified for each recommended ECM.

Figure 23 - ECM Incentive Program Eligibility

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

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

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

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

8.1 SmartStart

Overview

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 Direct Install

Overview

Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

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

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

8.3 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 $0.15/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.

8.4 SREC Registration Program

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

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

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

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

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

8.5 Energy Savings Improvement Program

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

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

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

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

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

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

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.13	641	0.0	$95.41	$255.61	$70.00	1.95
Electrical closet - 1st floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Electrical closet - 2nd floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Room 141	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,943	0.08	399	0.0	$59.42	$225.55	$50.00	2.95
L-15	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,943	0.08	399	0.0	$59.42	$225.55	$50.00	2.95
Gym/APR	15	LED - Fixtures: High-Bay	Wall Switch	18	2,775	None	Yes	15	LED - Fixtures: High-Bay	Occupancy Sensor	18	1,943	0.05	258	0.0	$38.47	$540.00	$70.00	12.22
Gym/APR	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen Area	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.19	948	0.0	$141.07	$328.64	$90.00	1.69
Kitchen wash area	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.06	316	0.0	$47.02	$109.55	$30.00	1.69
Kitchen Storage Area	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Kitchen storage hall	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Kitchen storage hall	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen hood	4	Incandescent: 1 Lamp	Wall Switch	60	2,775	Relamp	No	4	LED Screw-In Lamps: 1 Lamp	Wall Switch	9	2,775	0.13	651	0.0	$96.90	$68.90	$20.00	0.50
Gym/MPR Office	4	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	4	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	117	0.0	$17.44	$338.90	$35.00	17.42
Gym/MPR Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.12	599	0.0	$89.13	$164.32	$80.00	0.95
CR 205	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 205	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$51.68	$35.00	1.27
CR 202	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 202	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$51.68	$35.00	1.27
CR 201	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 201	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$51.68	$35.00	1.27
CR 206	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 206	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$51.68	$35.00	1.27
CR 204	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.37	1,797	0.0	$267.39	$492.95	$170.00	1.21
CR 204	10	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	10	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.06	293	0.0	$43.60	$442.25	$35.00	9.34

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR 204	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
CR 207	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 207	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$51.68	$35.00	1.27
CR 200	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 200	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$51.68	$35.00	1.27
Room 208	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,943	0.16	798	0.0	$118.84	$335.09	$80.00	2.15
2nd floor - Library	15	Compact Fluorescent: Long lamp - Plug in - 2 lamps	Wall Switch	80	2,775	Relamp	No	15	LED - Linear Tubes: (1) U-Lamp	Wall Switch	17	2,775	0.62	3,040	0.0	$452.41	$543.45	$0.00	1.20
Library	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Men's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.04	211	0.0	$31.35	$73.03	$20.00	1.69
Women's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.04	211	0.0	$31.35	$73.03	$20.00	1.69
CR 213	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 213	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$51.68	$35.00	1.27
Storage closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
FT room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.04	211	0.0	$31.35	$73.03	$20.00	1.69
CR 214	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 214	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$51.68	$35.00	1.27
Men's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.06	316	0.0	$47.02	$109.55	$30.00	1.69
Men's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Women's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.06	316	0.0	$47.02	$109.55	$30.00	1.69
Women's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Janitor's closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	2,775	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,775	0.01	43	0.0	$6.41	$16.26	$5.00	1.76
CR 228	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$554.18	$140.00	1.74
CR 229	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.25	1,198	0.0	$178.26	$444.64	$110.00	1.88
CR 230	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$554.18	$140.00	1.74
CR 231	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$554.18	$140.00	1.74

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR 234	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,943	0.60	2,928	0.0	$435.74	$1,073.33	$255.00	1.88
Conference room 233	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.25	1,198	0.0	$178.26	$444.64	$110.00	1.88
2nd floor hallway	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,943	0.57	2,795	0.0	$415.94	$1,566.82	$210.00	3.26
2nd floor hallway	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd floor hallway	16	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	16	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	High/Low Control	13	1,943	0.10	469	0.0	$69.76	$275.60	$0.00	3.95
Old section	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallways	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	7	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,943	0.29	1,397	0.0	$207.97	$583.41	$105.00	2.30
Hallways	6	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	6	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	High/Low Control	13	1,943	0.04	176	0.0	$26.16	$103.35	$0.00	3.95
2nd floor library entry	1	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	No	1	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Wall Switch	13	2,775	0.00	17	0.0	$2.56	$17.23	$0.00	6.72
Hallway hanging fixture	5	Incandescent: 1 - lamp	Wall Switch	60	2,775	Relamp	No	5	LED Screw-In Lamps: 1 Lamp	Wall Switch	9	2,775	0.17	814	0.0	$121.12	$86.13	$25.00	0.50
Hanging fixture entries	1	Incandescent: 1 - lamp	Wall Switch	60	2,775	Relamp	No	1	LED Screw-In Lamps: 1 Lamp	Wall Switch	9	2,775	0.03	163	0.0	$24.22	$17.23	$5.00	0.50
Stairwell	8	LED - Fixtures: Ambient - 2' - Indirect Fixture	Wall Switch	12	2,775	None	No	8	LED - Fixtures: Ambient - 2' - Indirect Fixture	Wall Switch	12	2,775	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Clock tower	1	Incandescent: Hanging fixture - 1 lamp	Wall Switch	60	2,775	Relamp	No	1	LED Screw-In Lamps: 1 Lamp	Wall Switch	9	2,775	0.03	163	0.0	$24.22	$17.23	$5.00	0.50
2nd floor hallway	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,943	0.37	1,797	0.0	$267.39	$492.95	$135.00	1.34
2nd floor hallway	11	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	11	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	High/Low Control	13	1,943	0.07	322	0.0	$47.96	$989.48	$0.00	20.63
2nd floor hallway	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
1st floor Main entrance	3	Compact Fluorescent: Plug in - recessed can - 2 lamps	Wall Switch	36	2,775	Relamp	No	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 2 Lamps	Wall Switch	25	2,775	0.02	103	0.0	$15.39	$103.35	$0.00	6.72
Display cabinet	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	2,775	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,775	0.01	43	0.0	$6.41	$16.26	$5.00	1.76
Hallway old section	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,943	0.37	1,797	0.0	$267.39	$1,292.95	$135.00	4.33
Hallway old section	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway old section	10	Compact Fluorescent: Plug in - recessed can - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	10	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	High/Low Control	13	1,943	0.06	293	0.0	$43.60	$172.25	$0.00	3.95
Front office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.09	421	0.0	$62.70	$146.06	$40.00	1.69
CR 104	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.37	1,797	0.0	$267.39	$762.95	$170.00	2.22
CR 104	10	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	10	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.06	293	0.0	$43.60	$172.25	$35.00	3.15
CR 104	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR 102	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 102	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$51.68	$35.00	1.27
CR 102 - restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.03	158	0.0	$23.51	$54.77	$15.00	1.69
CR 105	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 105	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$321.68	$35.00	21.92
CR 105 - restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.03	158	0.0	$23.51	$54.77	$15.00	1.69
CR 106	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 106	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$321.68	$35.00	21.92
CR 106 - restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.03	158	0.0	$23.51	$54.77	$15.00	1.69
CR 101	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 101	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$321.68	$35.00	21.92
CR 101 - restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.03	158	0.0	$23.51	$54.77	$15.00	1.69
CR 107	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 107	3	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.02	88	0.0	$13.08	$321.68	$35.00	21.92
CR 107 - restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.03	158	0.0	$23.51	$54.77	$15.00	1.69
Main office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.16	798	0.0	$118.84	$489.09	$95.00	3.32
Main office	2	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	2	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.01	59	0.0	$8.72	$34.45	$35.00	-0.06
Principal's office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.16	798	0.0	$118.84	$489.09	$95.00	3.32
Principal's office	1	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	1	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.01	29	0.0	$4.36	$17.23	$35.00	-4.08
Principal's office restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.03	158	0.0	$23.51	$54.77	$15.00	1.69
Health office 108	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.08	399	0.0	$59.42	$225.55	$50.00	2.95
Health office 108	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.08	399	0.0	$59.42	$225.55	$50.00	2.95
Health office 108 - restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.03	158	0.0	$23.51	$54.77	$15.00	1.69
Men's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.04	211	0.0	$31.35	$73.03	$20.00	1.69
Women's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.04	211	0.0	$31.35	$73.03	$20.00	1.69

	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
Library	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,943	0.41	1,996	0.0	$297.10	$817.73	$185.00	2.13
Library	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library	3	Compact Fluorescent: Long lamp - Plug in - 2 lamps	Wall Switch	80	2,775	Relamp	Yes	3	LED - Linear Tubes: (1) U-Lamp	Occupancy Sensor	17	1,943	0.13	655	0.0	$97.54	$108.69	$35.00	0.76
Library	8	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	8	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	Occupancy Sensor	13	1,943	0.05	234	0.0	$34.88	$137.80	$35.00	2.95
Stage Area	10	Compact Fluorescent: Long lamp - Plug in - 2 lamps	Wall Switch	80	2,775	Relamp	No	10	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,775	0.47	2,282	0.0	$339.61	$162.58	$50.00	0.33
Behind stage 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Behind stage 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
CR 114 computer lab	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
Men's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.06	316	0.0	$47.02	$109.55	$30.00	1.69
Women's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Janitor's closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,775	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,775	0.01	51	0.0	$7.60	$32.52	$10.00	2.96
Women's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.06	316	0.0	$47.02	$109.55	$30.00	1.69
Women's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,775	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,775	0.01	56	0.0	$8.31	$18.26	$5.00	1.59
CR 137	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
Office 136	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.25	1,198	0.0	$178.26	$598.64	$125.00	2.66
CR 138	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 139	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.33	1,597	0.0	$237.68	$708.18	$155.00	2.33
CR 142 Art	16	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	Yes	16	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,943	0.41	1,986	0.0	$295.62	$1,429.36	$35.00	4.72
CR 142 Art	11	LED Screw-In Lamps: Screw-in - 1 Lamp	Wall Switch	9	2,775	None	Yes	11	LED Screw-In Lamps: Screw-in - 1 Lamp	Occupancy Sensor	9	1,943	0.02	95	0.0	$14.11	$0.00	$35.00	-2.48
Hallway 1st floor	13	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	13	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway 1st floor	24	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	24	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,943	0.98	4,791	0.0	$713.03	$4,514.54	$360.00	5.83
Hallway 1st floor	16	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	16	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	High/Low Control	13	1,943	0.10	469	0.0	$69.76	$1,075.60	$0.00	15.42
Hallway 1st floor	5	Compact Fluorescent: Screw in - 1 lamp	Wall Switch	18	2,775	Relamp	Yes	5	LED Screw-In Lamps: Screw in - 1 Lamp	High/Low Control	13	1,943	0.03	146	0.0	$21.80	$86.13	$0.00	3.95
Hallway 1st floor	10	Compact Fluorescent: Recessed fixture - Plug in - 1 lamp	Wall Switch	13	2,775	Relamp	Yes	10	LED Screw-In Lamps: Recessed fixture - Plug-in - 1 Lamp	High/Low Control	9	1,943	0.04	212	0.0	$31.49	$172.25	$0.00	5.47
Hallway 1st floor	3	Incandescent: Hanging fixture - 1 lamp	Wall Switch	60	2,775	Relamp	Yes	3	LED Screw-In Lamps: 1 Lamp	High/Low Control	9	1,943	0.11	514	0.0	$76.52	$51.68	$15.00	0.48

	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
Stairwell near CR 104	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.06	316	0.0	$47.02	$109.55	$30.00	1.69
Stairwell near CR 104	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stairwell near elevator	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.11	527	0.0	$78.37	$182.58	$50.00	1.69
Elevator room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Men's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.06	316	0.0	$47.02	$109.55	$30.00	1.69
Men's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
Janitor's closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,775	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,775	0.01	51	0.0	$7.60	$32.52	$10.00	2.96
Women's restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.06	316	0.0	$47.02	$109.55	$30.00	1.69
Women's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.02	105	0.0	$15.67	$36.52	$10.00	1.69
CR L-11	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.49	2,395	0.0	$356.52	$927.27	$215.00	2.00
CR L-11	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,943	0.05	248	0.0	$36.95	$144.92	$35.00	2.97
CR L-12	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.49	2,395	0.0	$356.52	$927.27	$215.00	2.00
CR L-12	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,943	0.05	248	0.0	$36.95	$144.92	$35.00	2.97
Office L-13	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,943	0.16	798	0.0	$118.84	$335.09	$80.00	2.15
CR L-16	16	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	Yes	16	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,943	0.41	1,986	0.0	$295.62	$1,969.36	$105.00	6.31
CR L-16	12	LED Screw-In Lamps: Recessed can - screw in - 1 lamp	Wall Switch	9	2,775	None	Yes	12	LED Screw-In Lamps: Recessed can - screw in - 1 lamp	Occupancy Sensor	9	1,943	0.02	103	0.0	$15.39	$0.00	$35.00	-2.27
Stairwell L-16	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.11	527	0.0	$78.37	$182.58	$50.00	1.69
Stairwell L-16	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement Hallway	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,775	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,775	0.42	2,054	0.0	$305.65	$712.04	$195.00	1.69
Basement Hallway	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement Hallway	16	LED Screw-In Lamps: Recessed Can - 1 lamp	Wall Switch	9	2,775	None	No	16	LED Screw-In Lamps: Recessed Can - 1 lamp	Wall Switch	9	2,775	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement/Elevator/Mech area	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,775	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,775	0.04	211	0.0	$31.35	$73.03	$20.00	1.69
Wall pack	2	Metal Halide: (1) 100W Lamp	Wall Switch	128	2,775	Fixture Replacement	Yes	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Occupancy Sensor	38	1,943	0.13	645	0.0	$96.06	$2,181.93	$290.00	19.70
Pole lights	8	Metal Halide: (1) 150W Lamp	Wall Switch	190	2,775	Fixture Replacement	Yes	8	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Occupancy Sensor	57	1,943	0.79	3,832	0.0	$570.35	$9,806.03	$360.00	16.56
Front entry	3	Compact Fluorescent: Recessed can - plug in - 2 lamps	Wall Switch	36	2,775	Relamp	Yes	3	LED Screw-In Lamps: Recessed can - Plug in - 2 Lamps	Occupancy Sensor	25	1,943	0.04	176	0.0	$26.16	$353.35	$135.00	8.35

	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
Tower light	1	Metal Halide: (1) 50W Lamp	Wall Switch	72	2,775	Fixture Replacement	Yes	1	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Occupancy Sensor	22	1,943	0.04	182	0.0	$27.02	$1,444.50	$45.00	51.80

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
Boielr room	DHW	1	Other	0.3	60.0%	No	2,745	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boielr room	Heat supply	2	Heating Hot Water Pump	3.0	89.5%	No	2,745	No	89.5%	Yes	2	0.75	5,972	0.0	$888.81	$6,015.30	$0.00	6.77
Electrical closet 1st floor	Gym ACU -1	1	Supply Fan	2.0	86.5%	No	2,745	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Electrical closet - 2nd floor	Hallways 2nd floor	1	Supply Fan	1.5	86.5%	No	2,745	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classrooms	Unit ventilators	24	Supply Fan	0.3	60.0%	No	2,745	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Elevator room	Elevator	1	Other	20.0	91.0%	No	3,391	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Attic	AHU1,4,7	3	Supply Fan	2.0	86.5%	No	2,745	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Attic	AHU 2,3, ACU 2 and ACU 3	4	Supply Fan	1.5	86.5%	No	2,745	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
RCU 1	Gym	1	Split-System AC	10.00		Yes	1	Split-System AC	10.00		11.50		No	0.81	1,580	0.0	$235.22	$11,637.70	$730.00	46.37
RCU 2	RCU 2	1	Split-System AC	5.00		Yes	1	Split-System AC	5.00		14.00		No	1.03	1,741	0.0	$259.16	$7,481.10	$460.00	27.09
RCU 3	RCU 3	1	Split-System AC	5.00		Yes	1	Split-System AC	5.00		14.00		No	1.03	1,741	0.0	$259.16	$7,481.10	$460.00	27.09
RCU 4	Hallways	1	Split-System AC	6.00		Yes	1	Split-System AC	6.00		11.50		No	0.49	825	0.0	$122.79	$6,982.62	$438.00	53.30
RTU 2	RTU 2	1	Packaged AC	4.00		Yes	1	Split-System AC	4.00		14.00		No	0.89	1,497	0.0	$222.86	$5,984.88	$368.00	25.20
CU1	Room L-16	1	Split-System AC	7.50		Yes	1	Split-System AC	7.50		11.50		No	0.61	1,031	0.0	$153.48	$8,728.28	$547.50	53.30
CU 2	Science Lab	1	Split-System AC	5.00		Yes	1	Split-System AC	5.00		14.00		No	1.03	1,847	0.0	$274.97	$7,481.10	$460.00	25.53
CU 3	Room L-11	1	Split-System AC	5.00		Yes	1	Split-System AC	5.00		14.00		No	1.03	1,741	0.0	$259.16	$7,481.10	$460.00	27.09
CU 4	Art	1	Split-System AC	7.50		Yes	1	Split-System AC	7.50		11.50		No	0.61	1,031	0.0	$153.48	$8,728.28	$547.50	53.30
CU 5	Second floor hallway	1	Split-System AC	2.50		Yes	1	Split-System AC	2.50		14.00		No	0.52	871	0.0	$129.58	$3,740.55	$230.00	27.09
CU 6	Music	1	Split-System AC	7.50		Yes	1	Split-System AC	7.50		11.50		No	0.61	1,031	0.0	$153.48	$8,728.28	$547.50	53.30
CU 7	1st floor hallway	1	Split-System AC	2.50		Yes	1	Split-System AC	2.50		14.00		No	0.52	871	0.0	$129.58	$3,740.55	$230.00	27.09
Unknown	Unknown	1	Packaged Terminal AC	1.00		Yes	1	Packaged Terminal AC	1.00		12.00		No	0.08	137	0.0	$20.45	$1,914.81	$65.00	90.45
IT room	IT room	1	Split-System AC	2.00		Yes	1	Split-System AC	2.00		14.00		No	0.46	891	0.0	$132.68	$2,992.44	$184.00	21.17
Roof	Unknown	1	Split-System AC	2.50		Yes	1	Split-System AC	2.50		14.00		No	0.57	969	0.0	$144.29	$3,740.55	$230.00	24.33
Roof	Unknown	2	Split-System AC	5.00		Yes	2	Split-System AC	5.00		14.00		No	2.30	3,878	0.0	$577.15	$14,962.20	$920.00	24.33
Principal's office	Principal's office	1	Packaged Terminal AC	1.00		Yes	1	Packaged Terminal AC	1.00		12.00		No	0.08	137	0.0	$20.45	$1,914.81	$65.00	90.45

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	Elementary school	3	Non-Condensing Hot Water Boiler	346.00	Yes	3	Non-Condensing Hot Water Boiler	346.00	85.00%	Et	0.00	0	16.8	$158.04	$23,287.77	$1,816.50	135.86
Boiler room	Elementary school	1	Non-Condensing Hot Water Boiler	842.40	Yes	1	Non-Condensing Hot Water Boiler	842.00	85.00%	Et	0.00	0	18.5	$174.17	$18,890.46	$1,473.50	100.00
RTU 2	RTU2	1	Furnace	95.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
RTU 1	RTU 1	1	Furnace	95.00	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
Boiler room	Whole building	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions			Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Cooler (35F to 55F)	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Medium Temp Freezer (0F to 30F)	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Commercial Refrigerator/Freezer Inventory & Recommendations

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

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Gas Convection Oven (Half Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	2	Gas Steamer	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Insulated Food Holding Cabinet (1/2 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?
Village Charter School	78	Desktop	145.0	Yes
Village Charter School	14	Desk printer	60.0	Yes
Village Charter School	1	LCD Tv	100.0	Yes
Village Charter School	47	Laptops	45.0	Yes
Village Charter School	13	Mini Fridge	60.0	Yes
Village Charter School	14	Microwave	1,000.0	Yes
Village Charter School	28	Projector	200.0	Yes
Village Charter School	3	Photocopier	218.0	Yes
Village Charter School	2	Shredder	40.0	Yes
Village Charter School	1	Refrigerator	218.0	Yes
Village Charter School	2	DVR Box	30.0	Yes
Village Charter School	18	Laptop cart	60.0	Yes
Village Charter School	1	Kiln	11,000.0	Yes

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Village Charter School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 47,000
Built: 1999

For Year Ending: December 31, 2017
Date Generated: August 21, 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
Village Charter School 101 SULLIVAN WAY TRENTON, New Jersey 08628	Village Charter School 101 SULLIVAN WAY TRENTON, NJ 08628 (____)____-_____	PAUL DEWITT MERCER 101 SULLIVAN WAY TRENTON, NJ 08628 609-695-0110 EXT 116 pdewitt@villagecharter.org

Property ID: 6403567

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
56.9 kBtu/ft²

Source EUI
124.5 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	1,214,723 (45%)
Electric - Grid (kBtu)	1,457,937 (55%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	67.9
National Median Source EUI (kBtu/ft²)	148.7
% Diff from National Median Source EUI	-16%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	226

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)