Local Government Energy Audit:
Energy Audit Report

Village Elementary School

601 New Village Road

West Windsor, New Jersey 08550

West Windsor-Plainsboro Regional School District

March 22, 2019

Final Report by:

TRC Energy Services

Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

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

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual 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.

The New Jersey 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. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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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 Elementary School.

The goal of a 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 local governments in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

Village Elementary School is a 126,053 square foot facility comprised of two floors. Space types include classrooms, offices, gym, auditorium, cafeteria, corridors, stairwells, storage rooms, library, media center, a commercial kitchen and mechanical room including mechanical equipment.

Sections of the first and second floors were renovated in 2015. The renovation included lighting system upgrades to LED fixtures and occupancy sensor controls as well as installing high efficiency direct expansion (DX) air conditioning (AC) units. The remaining school building consists of aging and inefficient lighting and HVAC equipment in need of an upgrade. Heating is supplied by a gas-fired boiler and the domestic hot water is supplied by a dedicated hot water boiler with storage tank. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 11 measures which together represent an opportunity for Village Elementary School to reduce annual energy costs by $52,482 and annual greenhouse gas emissions by 452,160 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 3.4 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce Village Elementary School's annual energy use by 13%.

Figure 1 – Previous 12 Month Utility Costs

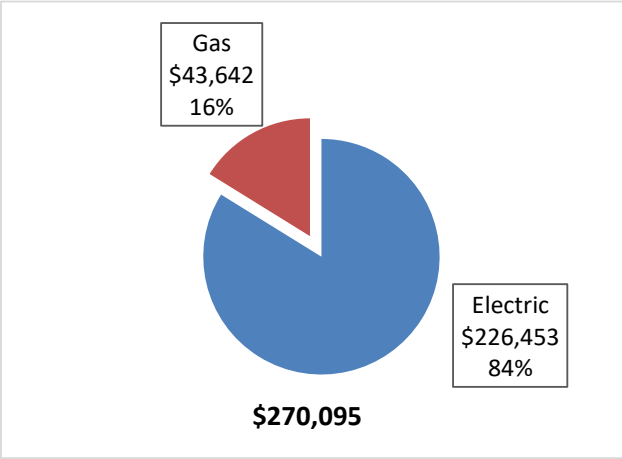
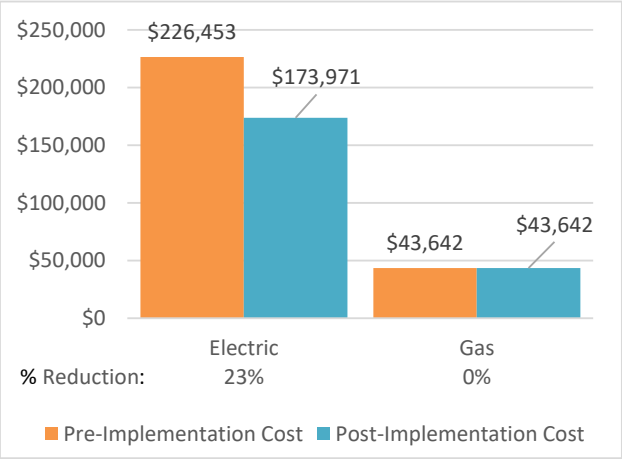


Figure 2 – Potential Post-Implementation Costs



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

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

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual 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			**173,044**	**32.7**	**0.0**	**$20,225.57**	**$80,695.73**	**$16,710.00**	**$63,985.73**	**3.2**	**174,254**
ECM 1	Install LED Fixtures	Yes	15,798	2.5	0.0	$1,846.44	$23,600.60	$1,210.00	$22,390.60	12.1	15,908
ECM 2	Retrofit Fixtures with LED Lamps	Yes	157,247	30.2	0.0	$18,379.13	$57,095.12	$15,500.00	$41,595.12	2.3	158,346
Lighting Control Measures			**37,780**	**7.2**	**0.0**	**$4,415.77**	**$31,610.00**	**$3,395.00**	**$28,215.00**	**6.4**	**38,044**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	33,513	6.4	0.0	$3,917.00	$27,810.00	$3,395.00	$24,415.00	6.2	33,747
ECM 4	Install High/Low Lighitng Controls	Yes	4,267	0.8	0.0	$498.77	$3,800.00	$0.00	$3,800.00	7.6	4,297
Motor Upgrades			**12,374**	**2.6**	**0.0**	**$1,446.24**	**$26,584.89**	**$0.00**	**$26,584.89**	**18.4**	**12,460**
ECM 5	Premium Efficiency Motors	Yes	12,374	2.6	0.0	$1,446.24	$26,584.89	$0.00	$26,584.89	18.4	12,460
Variable Frequency Drive (VFD) Measures			**222,291**	**28.7**	**0.0**	**$25,981.62**	**$66,850.45**	**$9,375.00**	**$57,475.45**	**2.2**	**223,845**
ECM 6	Install VFD on Variable Air Volume (VAV) HVAC	Yes	5,316	1.6	0.0	$621.28	$9,291.15	$775.00	$8,516.15	13.7	5,353
ECM 7	Install VFDs on Constant Volume (CV) HVAC	Yes	41,013	11.7	0.0	$4,793.59	$17,975.55	$3,200.00	$14,775.55	3.1	41,299
ECM 8	Install VFDs on Chilled Water Pumps	Yes	165,347	14.1	0.0	$19,325.90	$33,032.05	$5,400.00	$27,632.05	1.4	166,503
ECM 9	Install VFDs on Hot Water Pumps	Yes	10,616	1.3	0.0	$1,240.85	$6,551.70	$0.00	$6,551.70	5.3	10,691
Food Service Equipment & Refrigeration Measures			**308**	**0.0**	**0.0**	**$35.95**	**$303.30**	**$0.00**	**$303.30**	**8.4**	**310**
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	308	0.0	0.0	$35.95	$303.30	$0.00	$303.30	8.4	310
Plug Load Equipment Control - Vending Machine			**3,224**	**0.0**	**0.0**	**$376.79**	**$460.00**	**$0.00**	**$460.00**	**1.2**	**3,246**
ECM 11	Vending Machine Control	Yes	3,224	0.0	0.0	$376.79	$460.00	$0.00	$460.00	1.2	3,246
TOTALS FOR HIGH PRIORITY MEASURES			**449,020**	**71.3**	**0.0**	**$52,481.93**	**$206,504.37**	**$29,480.00**	**$177,024.37**	**3.4**	**452,160**
TOTALS FOR ALL EVALUATED MEASURES			**449,020**	**71.3**	**0.0**	**$52,481.93**	**$206,504.37**	**$29,480.00**	**$177,024.37**	**3.4**	**452,160**

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

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

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

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

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

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

Food Service Equipment & Refrigeration measures generally involve improvements in the efficiency of cooking, food service, dishwashing, and food storage equipment. These measures may include more efficient convection ovens, steamers, ice machines, or refrigeration. These measures save energy by reducing the energy usage with more energy efficient equipment.

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

Energy Efficient Practices

TRC also identified seven 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 Elementary School include:

- Ensure Lighting Controls Are Operating Properly
- Assess Chillers & Request Tune-Ups
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Perform Boiler Maintenance
- Perform Water Heater Maintenance
- 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 Elementary 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	360	kW DC STC
Electric Generation	428,894	kWh/yr
Displaced Cost	$37,310	/yr
Installed Cost	$936,000	

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
- SREC (Solar Renewable Energy Certificate) Registration Program (SRP)
- Energy Savings Improvement Program (ESIP)
- Demand Response Energy Aggregator

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.

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

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

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Dr. Christopher Russo	Business Administrator	christopher.russo@ww-p.org	609-716-5000, extension 5020
Designated Representative			
Daniel Riggle	Account Executive	daniel.riggle@schneider-electric.com	808-346-2907
TRC Energy Services			
Alexander Klieverik	Auditor	AKlieverik@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On August 09, 2018, TRC performed an energy audit at Village Elementary School located in West Windsor, New Jersey. TRC's team met with Daniel Riggle to review the facility operations and help focus our investigation on specific energy-using systems.

Village Elementary School is a 126,053 square foot facility comprised of classrooms, offices, gym, auditorium, cafeteria, corridors, stairwells, storage rooms, library, media center, a commercial kitchen and mechanical room including mechanical equipment.

The building was constructed in 1995. The school has undergone a renovation to a section of the first and second floor of the building in 2015. The renovation included lighting system upgrades to LED fixtures and occupancy sensor controls as well as installing high efficiency DX AC units. The site is interested in a new energy management system.

2.3 Building Occupancy

The school building is open Monday through Friday. The typical schedule is presented in the table below. The entire facility is used year-round and camps are run throughout the summer. During a typical day, the facility is occupied by approximately 122 staff and 720 students.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Village Elementary School	Weekday	Mon-Fri, 7 am - 4 pm (full) 6 am - 6 pm (partial)
Village Elementary School	Weekend	No Operation

2.4 Building Envelope

The building is constructed of concrete block and structural steel with a brick facade. The buildings have flat roofs covered with black membrane that is 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 and in good condition except that the door seals have worn out which increases the level of outside air infiltration.

Figure 7 - Building Rooftop and Exterior

2.5 On-Site Generation

Village Elementary School has a 350 kW generator installed for emergency power loss. The school does not have any additional on-site electric generation capacity.

2.6 Energy-Using Systems

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

Lighting System

Lighting is provided mostly by 32-Watt linear fluorescent T8 lamps with electronic ballasts as well as some compact fluorescent lamps (CFL). Most of the fixtures are 2-lamp or 3-lamp, 4-foot long troffers with diffusers. The renovated space is upgraded with linear LED tubes and LED troffers.

Lighting control in most spaces is provided by wall switch. Occupancy sensors are installed in the renovated sections of the building. The occupancy sensors are either wall or ceiling mounted depending on the space layout. Stairwells, elevator lobbies and main lobby areas do not contain any occupancy sensors.

Exterior lighting is minimal and consists primarily of metal halide (MH) fixtures that are controlled by timers, however lights were seen on during a sunny day.

Chilled Water or Condenser Water System

The facility is served by a single chilled water plant. The chiller plant consists of a Carrier 325-ton, R-134A, centrifugal chiller (CH1). The chiller is configured in a primary distribution loop with two constant flow pumps (PCHWP 1 & 2). The chiller is supplied by a dedicated 10 hp primary pump with a rated flow of 440 gallons per minute (gpm). Chilled water is distributed to the facility based on a reset schedule. The chiller operation could not be captured during the audit so the schedule of operation and temperature setpoints could not be recorded.

The chiller plant supplies chilled water to air handlers 1 through 4. The facility engineers manually stage chillers on to meet the load, operating the least number of chillers required. The chiller plant is in good condition and has been well maintained.

The condenser water system consists of one, three-cell cooling tower (CT1) with three fan motors. The fan motor nameplates were not visible at the time of audit so based on the motors' observed size it is estimated that each fan motor is about 10 hp. Fan motors are staged based on maintaining basin water temperature. Condenser water is supplied to the chillers by two 30 hp, constant flow pumps (CWP 1, 2 & 3). The cooling tower operation was not captured at the time of inspection.

Hot Water Heating System

The hot water system consists of two Weil-McLain 1,656 MBh output, forced draft boilers (BR1 & 2). The boilers have a nominal combustion efficiency of 80%. Each boiler has a 0.5 hp forced draft fan. The boilers are configured in a constant flow primary distribution with two hot water pumps (HHWP1 & 2). Each boiler is supplied by a dedicated 5 hp pump. The boilers provide hot water to air handlers 1 through 4. The boilers' sequence of operation is provided in the figure below.

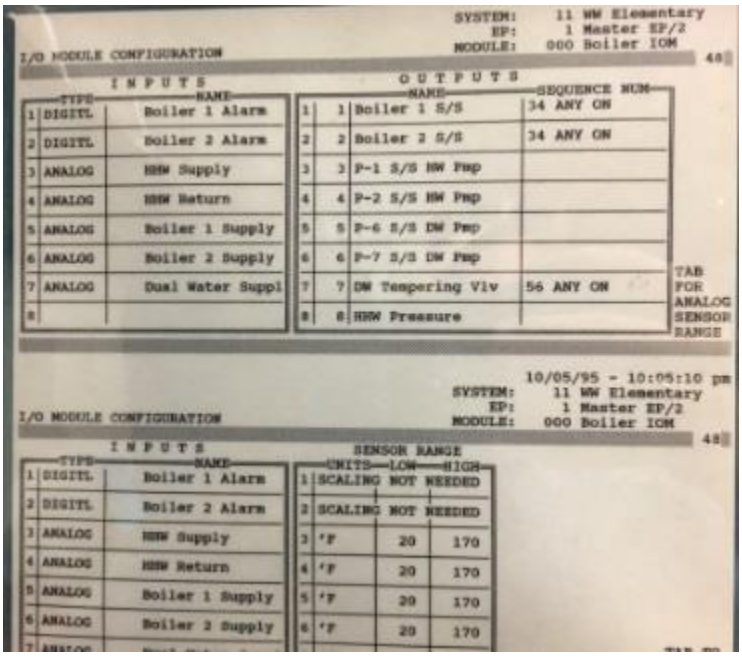


Figure 8 - Boilers' SOP

The boilers operate in a lead/lag configuration. Both boilers may be required during cold weather. The boilers are in good condition and well maintained.

Chilled Water Air Conditioning System (CHW)

There are five air handling units (AHU1, 1A, 2, 3 & 4) which are single zone Variable Air Volume (VAV) units along with cooling and heating coils providing conditioned air to various spaces throughout the school. AHU1A serves the custodial area, AHU1 and 2 serve the school's gymnasium.

AHU 1A and AHU1 are smaller units with 3 hp supply fan and a 1 HP return fan. AHU2 contains a 5 hp supply fan motor and 3 HP return fan motor.

AHU3 and 4 are the same size, also equipped with cooling and heating coil, receiving chilled water supply from the chiller and hot water from the boiler. The units have bypass legs on both the chilled water supply and hot water supply and have 2-way valves, with outside air economizer, and are identified to be single zone system.

Additionally, AHU 3 is a VAV unit containing VFD on the supply fan motor. AHU 3 and 4 serve the classrooms on the second floor.

AHU 3 and 4 are similar in size and since there was no access available to the units' supply fan motors, it is estimated that each of the units are equipped with 7.5 HP supply fan motors.

The five unit operating condition and their schedules were not available at the time of energy audit.

Direct Expansion Air Conditioning System (DX)

There are two 15.5-ton Annex direct-expansion (DX) package units with reheat coils that are used to condition the new section of the school's boardroom and classrooms. The units are located on the roof. Each unit provides constant air volume with a single 5 hp supply fan and a 5 hp return fan. The unit uses a scroll compressor and a direct-expansion DX coil. The reheat coil provides additional heating to the return air as needed.

There are also two, 7-ton AAON DX package units with gas-fired burners with no outside air economizer, which are used to condition the new section of the school's boardrooms. The units are located on the roof. Each unit provides constant air volume with a single 5 hp supply fan and a 5 hp return fan. The unit utilize a scroll compressor and a DX coil. The gas-fired burners are to provide additional heating when the units operate in heating mode only.

There are five small Carrier cooling only split systems ranging in size from 2-4 tons at various locations throughout the school (computer labs, office space and classrooms). The evaporators and fans are located in the rooms. The compressor and condensing unit are located on the rooftop. The unit provides constant air volume with a single 0.25 hp supply fan. These units are manually controlled by a thermostat located in zone.

Domestic Hot Water Heating System

The domestic hot water heating system consists of a Smith gas-fired hot water heater with an input rating of 199,000 kBtu/hr each and a nominal efficiency of 80%. The water heater has an 81-gallon storage tank. Two recirculation pumps distribute water to the entire site. The recirculation pumps operate continuously.

Food Service

The school has an all-electric kitchen that is used to prepare breakfast and lunches per day for the students and staff. Most of the cooking is done using the convection oven, the single large griddle and the combined oven and steamer cooker.

Refrigeration

The kitchen has a walk-in refrigerator that is used to store food prepared for school lunches. It is estimated that the refrigerator has a single 2-ton air cooled compressor. The walk-in space temperature is maintained at 34°F. The kitchen also has a free-standing commercial size freezer.

Building Plug Load

There are roughly 80 computer work stations throughout the facility. Roughly 90% of the computers are desktop units with LCD monitors. There is no centralized PC power management software installed.

The facility has two refrigerated beverage vending machines.

2.7 Water-Using Systems

There are 20 restrooms at this facility. A sampling of restrooms found that faucets are rated for 3.5 gallons per minute (gpm) or higher; toilets are rated at 2.5 gallons per flush (gpf) and urinals are rated at 2 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

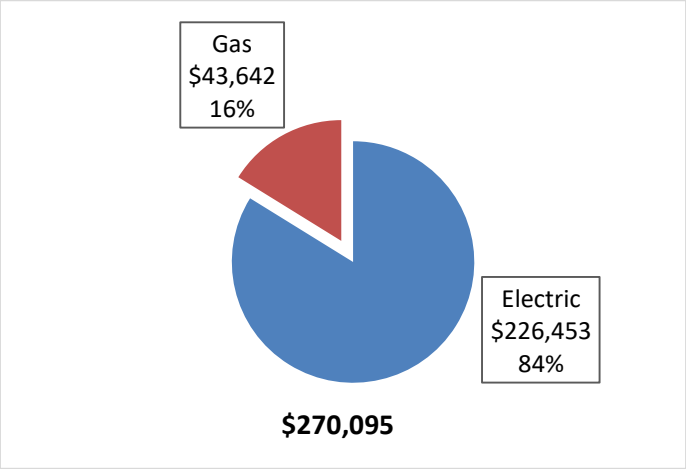
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 9 - Utility Summary

Utility Summary for Village Elementary School		
Fuel	**Usage**	**Cost**
Electricity	1,937,468 kWh	$226,453
Natural Gas	51,188 Therms	$43,642
Total		**$270,095**

The current annual energy cost for this facility is $270,095 as shown in the chart below.

Figure 10 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by JCP&L. The average electric cost over the past 12 months was $0.117/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 highest monthly electricity use occurred in July indicating that there is significant activity on campus during the summer months. The energy analysis required longer operating hours than anticipated which also indicates that some equipment is operating when the school is not in use. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 11 - Electric Usage & Demand

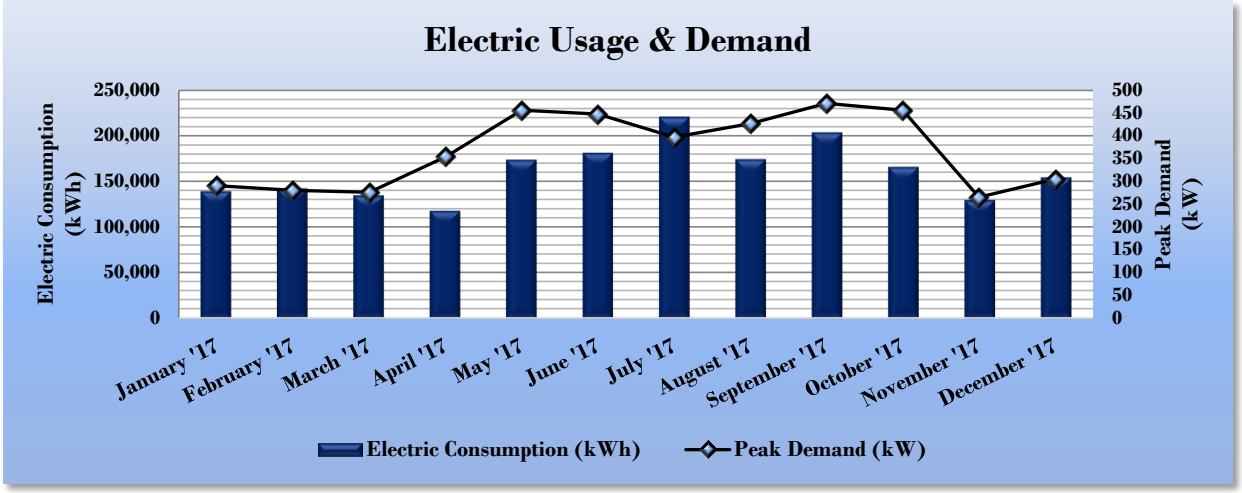


Figure 12 - Electric Usage & Demand

Electric Billing Data for Village Elementary School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
1/31/17	27	138,880	291		$16,175
3/1/17	29	141,760	280		$16,568
3/30/17	29	134,400	276		$15,760
4/28/17	29	117,440	354		$14,532
6/1/17	34	173,120	456		$21,102
6/30/17	29	180,800	448		$21,628
8/2/17	33	220,160	397		$25,036
8/31/17	29	173,760	427		$20,520
10/2/17	32	203,200	471		$23,579
11/1/17	30	165,440	457		$19,677
12/1/17	30	129,280	265		$14,822
1/3/18	33	153,920	305		$16,433
Totals	**364**	**1,932,160**	**471.1**	**$0**	**$225,833**
Annual	**365**	**1,937,468**	**471.1**	**$0**	**$226,453**

3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is $0.853/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 13 - Natural Gas Usage

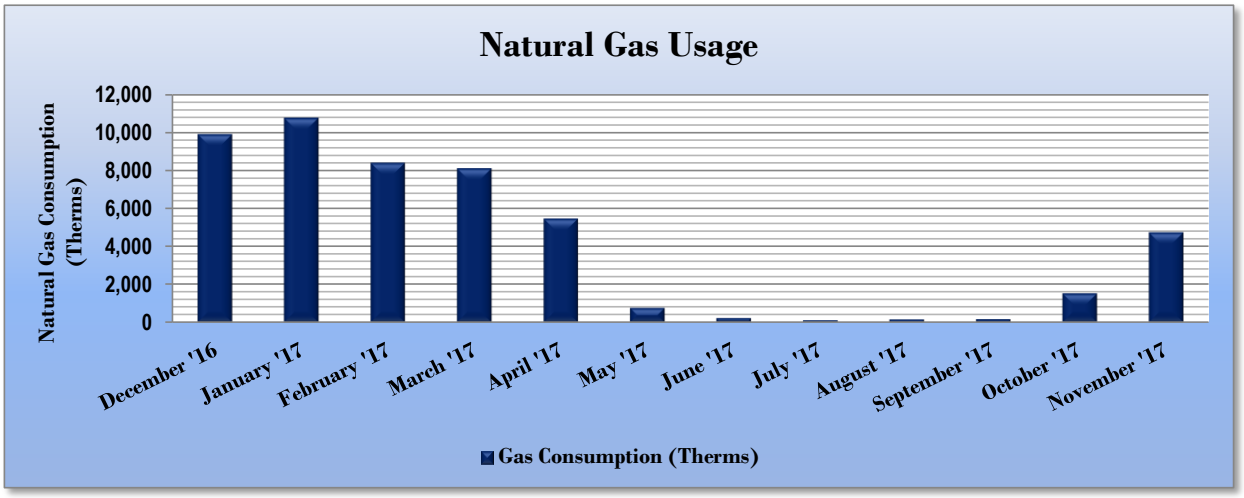


Figure 14 - Natural Gas Usage

Gas Billing Data for Village Elementary School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
12/13/16	33	9,909	$8,578
1/18/17	35	10,778	$9,335
2/16/17	28	8,404	$7,628
3/20/17	31	8,110	$7,408
4/17/17	27	5,462	$3,524
5/18/17	30	768	$590
6/19/17	31	220	$247
7/19/17	29	115	$180
8/17/17	28	146	$197
9/17/17	30	167	$214
10/17/17	29	1,523	$1,396
11/15/17	28	4,745	$3,628
Totals	**359**	**50,346**	**$42,925**
Annual	**365**	**51,188**	**$43,642**

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 15 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Village Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	207.3	141.4
Site Energy Use Intensity (kBtu/ft^2)	93.1	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 16 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Village Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	169.1	141.4
Site Energy Use Intensity (kBtu/ft^2)	80.9	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 17.

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

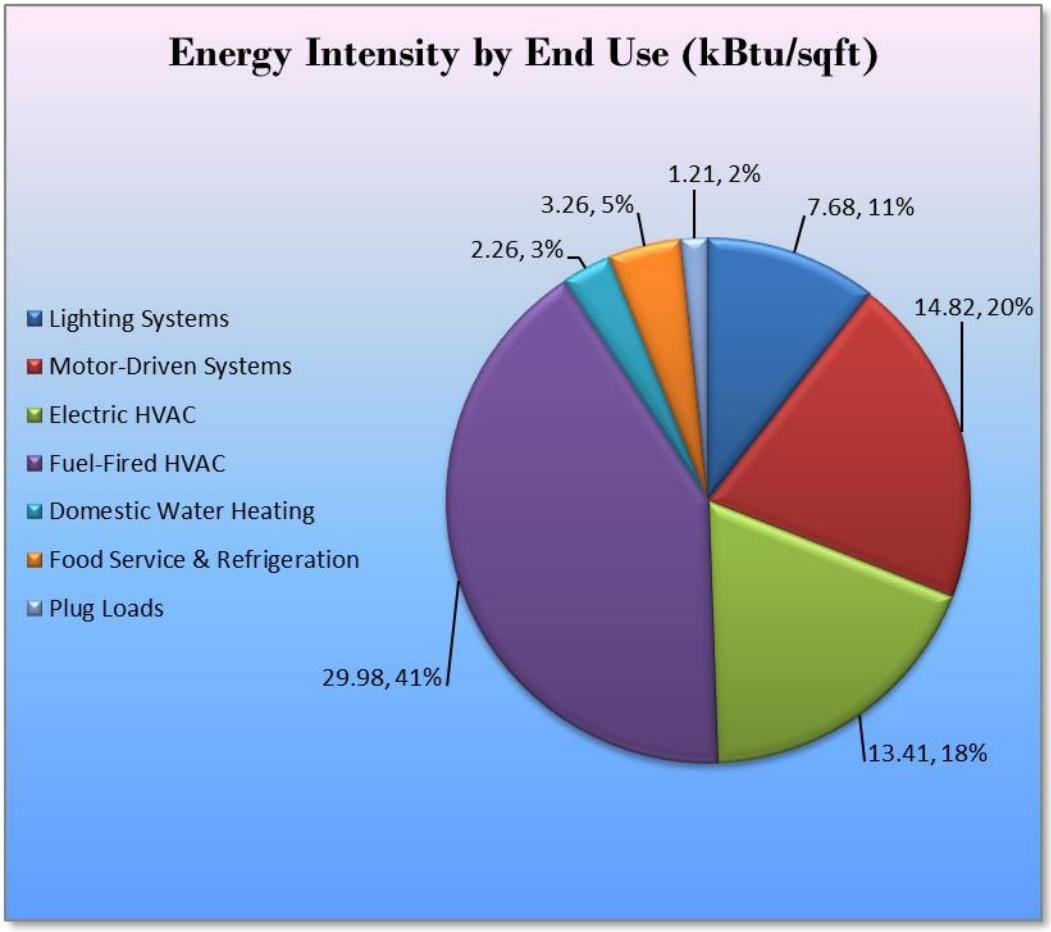
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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

4.1 Recommended ECMs

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

Figure 18 – 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		**173,044**	**32.7**	**0.0**	**$20,225.57**	**$80,695.73**	**$16,710.00**	**$63,985.73**	**3.2**	**174,254**
ECM 1	Install LED Fixtures	15,798	2.5	0.0	$1,846.44	$23,600.60	$1,210.00	$22,390.60	12.1	15,908
ECM 2	Retrofit Fixtures with LED Lamps	157,247	30.2	0.0	$18,379.13	$57,095.12	$15,500.00	$41,595.12	2.3	158,346
Lighting Control Measures		**37,780**	**7.2**	**0.0**	**$4,415.77**	**$31,610.00**	**$3,395.00**	**$28,215.00**	**6.4**	**38,044**
ECM 3	Install Occupancy Sensor Lighting Controls	33,513	6.4	0.0	$3,917.00	$27,810.00	$3,395.00	$24,415.00	6.2	33,747
ECM 4	Install High/Low Lighitng Controls	4,267	0.8	0.0	$498.77	$3,800.00	$0.00	$3,800.00	7.6	4,297
Motor Upgrades		**12,374**	**2.6**	**0.0**	**$1,446.24**	**$26,584.89**	**$0.00**	**$26,584.89**	**18.4**	**12,460**
ECM 5	Premium Efficiency Motors	12,374	2.6	0.0	$1,446.24	$26,584.89	$0.00	$26,584.89	18.4	12,460
Variable Frequency Drive (VFD) Measures		**222,291**	**28.7**	**0.0**	**$25,981.62**	**$66,850.45**	**$9,375.00**	**$57,475.45**	**2.2**	**223,845**
ECM 6	Install VFD on Variable Air Volume (VAV) HVAC	5,316	1.6	0.0	$621.28	$9,291.15	$775.00	$8,516.15	13.7	5,353
ECM 7	Install VFDs on Constant Volume (CV) HVAC	41,013	11.7	0.0	$4,793.59	$17,975.55	$3,200.00	$14,775.55	3.1	41,299
ECM 8	Install VFDs on Chilled Water Pumps	165,347	14.1	0.0	$19,325.90	$33,032.05	$5,400.00	$27,632.05	1.4	166,503
ECM 9	Install VFDs on Hot Water Pumps	10,616	1.3	0.0	$1,240.85	$6,551.70	$0.00	$6,551.70	5.3	10,691
Food Service Equipment & Refrigeration Measures		**308**	**0.0**	**0.0**	**$35.95**	**$303.30**	**$0.00**	**$303.30**	**8.4**	**310**
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	308	0.0	0.0	$35.95	$303.30	$0.00	$303.30	8.4	310
Plug Load Equipment Control - Vending Machine		**3,224**	**0.0**	**0.0**	**$376.79**	**$460.00**	**$0.00**	**$460.00**	**1.2**	**3,246**
ECM 11	Vending Machine Control	3,224	0.0	0.0	$376.79	$460.00	$0.00	$460.00	1.2	3,246
TOTALS		**449,020**	**71.3**	**0.0**	**$52,481.93**	**$206,504.37**	**$29,480.00**	**$177,024.37**	**3.4**	**452,160**

* - 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 19 below.

Figure 19 – 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		**173,044**	**32.7**	**0.0**	**$20,225.57**	**$80,695.73**	**$16,710.00**	**$63,985.73**	**3.2**	**174,254**
ECM 1	Install LED Fixtures	15,798	2.5	0.0	$1,846.44	$23,600.60	$1,210.00	$22,390.60	12.1	15,908
ECM 2	Retrofit Fixtures with LED Lamps	157,247	30.2	0.0	$18,379.13	$57,095.12	$15,500.00	$41,595.12	2.3	158,346

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	15,798	2.5	0.0	$1,846.44	$23,600.60	$1,210.00	$22,390.60	12.1	15,908

Measure Description

We recommend replacing existing fixtures containing metal halide (MH) 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	157,247	30.2	0.0	$18,379.13	$57,095.12	$15,500.00	$41,595.12	2.3	158,346
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

4.1.2 Lighting Control Measures

Our recommendations for lighting control measures are summarized in Figure 20 below.

Figure 20 – 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		**37,780**	**7.2**	**0.0**	**$4,415.77**	**$31,610.00**	**$3,395.00**	**$28,215.00**	**6.4**	**38,044**
ECM 3	Install Occupancy Sensor Lighting Controls	33,513	6.4	0.0	$3,917.00	$27,810.00	$3,395.00	$24,415.00	6.2	33,747
ECM 4	Install High/Low Lighitng Controls	4,267	0.8	0.0	$498.77	$3,800.00	$0.00	$3,800.00	7.6	4,297

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)
33,513	6.4	0.0	$3,917.00	$27,810.00	$3,395.00	$24,415.00	6.2	33,747

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in all restrooms, library, classrooms, offices areas, and hallways. 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)
4,267	0.8	0.0	$498.77	$3,800.00	$0.00	$3,800.00	7.6	4,297

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 and interior corridors.

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

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

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

4.1.3 Motor Upgrades

Our recommendations for motor upgrade measures are summarized in Figure 21 below.

Figure 21 - Summary of Motor Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**12,374**	**2.6**	**0.0**	**$1,446.24**	**$26,584.89**	**$0.00**	**$26,584.89**	**18.4**	**12,460**
ECM 5	Premium Efficiency Motors	12,374	2.6	0.0	$1,446.24	$26,584.89	$0.00	$26,584.89	18.4	12,460

ECM 5: Premium Efficiency Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
12,374	2.6	0.0	$1,446.24	$26,584.89	$0.00	$26,584.89	18.4	12,460

Measure Description

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

4.1.4 Variable Frequency Drive Measures

Our recommendations for variable frequency drive (VFD) measures are summarized in Figure 22 below.

Figure 22 – 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		**222,291**	**28.7**	**0.0**	**$25,981.62**	**$66,850.45**	**$9,375.00**	**$57,475.45**	**2.2**	**223,845**
ECM 6	Install VFD on Variable Air Volume (VAV) HVAC	5,316	1.6	0.0	$621.28	$9,291.15	$775.00	$8,516.15	13.7	5,353
ECM 7	Install VFDs on Constant Volume (CV) HVAC	41,013	11.7	0.0	$4,793.59	$17,975.55	$3,200.00	$14,775.55	3.1	41,299
ECM 8	Install VFDs on Chilled Water Pumps	165,347	14.1	0.0	$19,325.90	$33,032.05	$5,400.00	$27,632.05	1.4	166,503
ECM 9	Install VFDs on Hot Water Pumps	10,616	1.3	0.0	$1,240.85	$6,551.70	$0.00	$6,551.70	5.3	10,691

ECM 6: Install VFD on Variable Air Volume (VAV) HVAC

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
5,316	1.6	0.0	$621.28	$9,291.15	$775.00	$8,516.15	13.7	5,353

Measure Description

We recommend replacing existing air volume control devices on air handling units (AHUs), such as inlet vanes and variable pitch fan blades, with variable frequency drives (VFDs). Inlet guide vanes and variable pitch fan blades are an inefficient means of controlling the air volume compared to VFDs. The existing volume control device would be removed, or permanently disabled, and the control signal would be redirected to the VFD to determine proper fan motor speed. Energy savings results from more efficient control of motor energy usage when fan motors are operated at partial load. The magnitude of energy savings is based on the estimated amount of time that fan motors would be operated at partial load.

Additional maintenance savings may result from this measure as well, since VFDs are solid state electronic device, which generally requires less maintenance than mechanical air volume control devices.

ECM 7: Install VFDs on Constant Volume (CV) HVAC

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
41,013	11.7	0.0	$4,793.59	$17,975.55	$3,200.00	$14,775.55	3.1	41,299

Measure Description

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

VAV systems should not be controlled such that the supply air temperature is raised at the expense of the fan power. A common mistake is to reset the supply air temperature to achieve chiller energy savings, which can lead to additional air flow requirements. Supply air temperature should be kept low, e.g. 55°F, until the minimum fan speed (typically about 50%) is met.

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

ECM 8: Install VFDs on Chilled 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)
165,347	14.1	0.0	$19,325.90	$33,032.05	$5,400.00	$27,632.05	1.4	166,503

Measure Description

We recommend installing a variable frequency drives (VFD) to control chilled water pumps. This measure requires that chilled water coils be served by 2-way valves and that a differential pressure sensor be installed in the chilled water loop. As the chilled 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 chilled water valves close. The magnitude of energy savings is based on the estimated amount of time that the system operates at reduced loads.

For systems with variable chilled water flow through the chiller, the minimum flow to prevent the chiller from tripping off will have to be determined during the final project design. The control system should be programmed to maintain the minimum flow through the chiller and to prevent pump cavitation.

ECM 9: 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)
10,616	1.3	0.0	$1,240.85	$6,551.70	$0.00	$6,551.70	5.3	10,691

Measure Description

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

4.1.5 Food Service Equipment & Refrigeration Measures

Our recommendations for food service and refrigeration measures are summarized in Figure 23 below.

Figure 23 - Summary of Food Service Equipment & Refrigeration 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)
Food Service Equipment & Refrigeration Measures		**308**	**0.0**	**0.0**	**$35.95**	**$303.30**	**$0.00**	**$303.30**	**8.4**	**310**
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	308	0.0	0.0	$35.95	$303.30	$0.00	$303.30	8.4	310

ECM 10: Refrigerator/Freezer Case Electrically Commutated Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
308	0.0	0.0	$35.95	$303.30	$0.00	$303.30	8.4	310

Measure Description

We recommend replacing shaded pole or permanent split capacitor (PSC) motors with electronically commutated (EC) motors in existing walk-in freezer. These fractional horsepower EC motors are significantly more efficient than mechanically commutated, brushed motors, particularly at low speeds or partial load. By employing variable-speed technology, EC motors are able to optimize fan usage. Because these motors are brushless and utilize DC power, losses due to friction and phase shifting are eliminated. Savings for this measure take into account both the increased efficiency of the motor as well as the reduction in refrigeration load due to motor heat loss.

4.1.6 Plug Load Equipment Control - Vending Machines

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

Figure 24 - Summary of Plug Load Equipment Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine		**3,224**	**0.0**	**0.0**	**$376.79**	**$460.00**	**$0.00**	**$460.00**	**1.2**	**3,246**
ECM 11	Vending Machine Control	3,224	0.0	0.0	$376.79	$460.00	$0.00	$460.00	1.2	3,246

ECM 11: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
3,224	0.0	0.0	$376.79	$460.00	$0.00	$460.00	1.2	3,246

Measure Description

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

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.

Ensure Lighting Controls Are Operating Properly

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

Assess Chillers & Request Tune-Ups

Chillers are responsible for a substantial portion of a commercial building's overall energy usage. When components of a chiller are not optimized, this can quickly result in a noticeable increase in energy bills. Chiller diagnostics can produce a 5% to 10% cost avoidance potential from discovery and implementation of low/no cost optimization strategies.

Clean Evaporator/Condenser Coils on AC Systems

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

Clean and/or Replace HVAC Filters

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

Perform Boiler Maintenance

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

Perform Water Heater Maintenance

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

Water Conservation

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

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

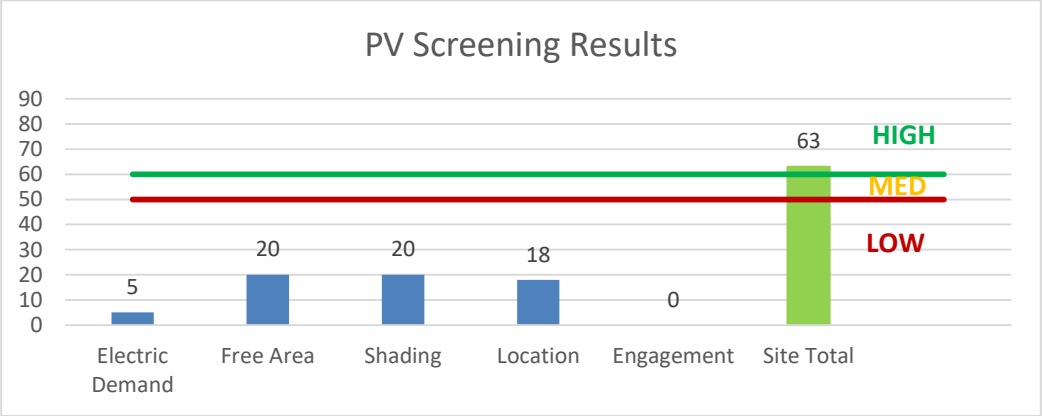
Sunlight can be converted into electricity using photovoltaics (PV) modules. Modules are racked together into an array that produces direct current (DC) electricity. The DC is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility's electrical distribution 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.

In order to be cost-effective, a solar PV array needs certain minimum criteria, such as flat or south-facing rooftop or other unshaded space on which to place the PV panels. In our opinion, the facility does appear not meet these minimum criteria for cost-effective PV installation.

If Village Elementary School is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 25 - Photovoltaic Screening



Potential	High	
System Potential	360	kW DC STC
Electric Generation	428,894	kWh/yr
Displaced Cost	$37,310	/yr
Installed Cost	$936,000	

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 8.2 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.

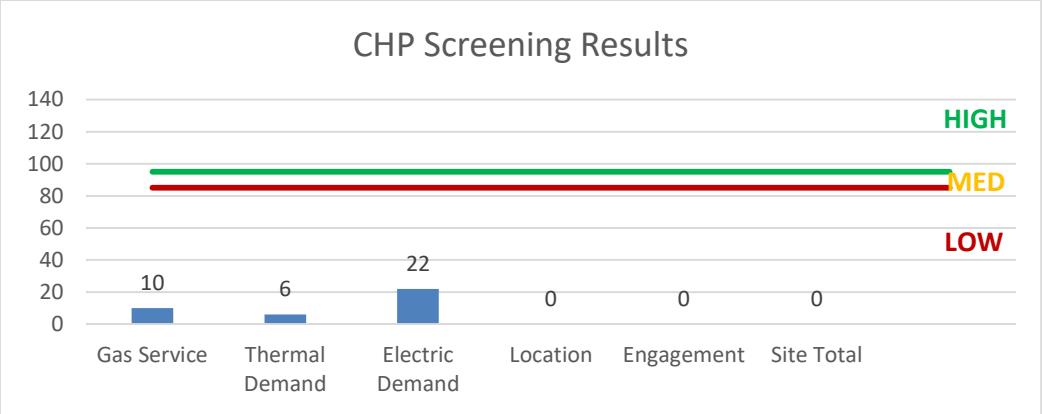
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste 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.

Lack of gas service, 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 26 - 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.

Based on this study, TRC recommends the evaluation of DR program participation for this site.

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

Figure 27 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x					
ECM 2	Retrofit Fixtures with LED Lamps	x					
ECM 3	Install Occupancy Sensor Lighting Controls	x					
ECM 4	Install High/Low Lighitng Controls	x					
ECM 5	Premium Efficiency Motors	x					
ECM 6	Install VFD on Variable Air Volume (VAV) HVAC	x					
ECM 7	Install VFDs on Constant Volume (CV) HVAC	x					
ECM 8	Install VFDs on Chilled Water Pumps						
ECM 9	Install VFDs on Hot Water Pumps						
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors						
ECM 11	Vending Machine Control						

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 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.

8.3 Energy Savings Improvement Program

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

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

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

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

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

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

8.4 Demand Response Energy Aggregator

The first step toward participation in a Demand Response (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 program information.

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

See Section 7 for additional information.

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Old Section B.	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.10	500	0.0	$58.49	$416.06	$75.00	5.83
Old Section Room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Electrical Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.09	61	0.0	$7.10	$146.06	$40.00	14.94
Electrical Room	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
Generator Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.11	569	0.0	$66.53	$182.58	$50.00	1.99
Custodial Area	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.25	1,295	0.0	$151.34	$598.64	$125.00	3.13
Custodial Area	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
Custodial Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.02	114	0.0	$13.31	$36.52	$10.00	1.99
Custodial Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,000	0.03	171	0.0	$19.96	$54.77	$15.00	1.99
Break Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.12	647	0.0	$75.67	$434.32	$80.00	4.68
Teacher's Lounge	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
Teacher's phone room	1	Compact Fluorescent: CFL 18 Watt - 1L	Wall Switch	18	3,000	Relamp	No	1	LED Screw-In Lamps: 1 Lamp	Wall Switch	13	3,000	0.00	19	0.0	$2.18	$24.21	$5.00	8.82
Gym	36	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	120	3,000	Relamp	Yes	36	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	1.87	9,861	0.0	$1,152.62	$3,439.08	$825.00	2.27
Gym	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
Gym Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	280	0.16	115	0.0	$13.45	$489.09	$95.00	29.30
Gym Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
Gym RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,000	0.03	171	0.0	$19.96	$54.77	$15.00	1.99
Kitchen Area	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.70	3,669	0.0	$428.78	$1,201.13	$290.00	2.12
Kitchen Area	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen Locker Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,000	0.03	171	0.0	$19.96	$54.77	$15.00	1.99
Kitchen Area RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Custodial Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.02	15	0.0	$1.77	$36.52	$10.00	14.94
Kitchen Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.05	288	0.0	$33.63	$343.03	$20.00	9.61
Vent Hood	4	Incandescent: Inc. 40 Watt - 1L	Wall Switch	40	3,000	Relamp	No	4	LED Screw-In Lamps: 1 Lamp	Wall Switch	8	3,000	0.08	442	0.0	$51.61	$96.84	$20.00	1.49
Cafeteria	25	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	25	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	1.03	5,395	0.0	$630.57	$1,909.31	$445.00	2.32

	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
Cafeteria	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
Mechanical Room	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.30	1,583	0.0	$184.97	$671.67	$145.00	2.85
Mechanical Room Main Office	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.19	1,025	0.0	$119.76	$328.64	$90.00	1.99
Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,100	0.03	151	0.0	$17.62	$306.52	$45.00	14.84
Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$109.55	$65.00	0.88
Boys RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,100	0.03	151	0.0	$17.62	$306.52	$45.00	14.84
Boys RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$109.55	$65.00	0.88
Mens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Womens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Elec Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.04	30	0.0	$3.55	$73.03	$20.00	14.94
Nurse's Suite	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.45	2,374	0.0	$277.45	$872.50	$200.00	2.42
Nurse's Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
Nurse's RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Nurse's Storage Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	400	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	280	0.12	86	0.0	$10.09	$434.32	$80.00	35.12
Nurse's Exam Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$379.55	$65.00	6.24
Guidance Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$379.55	$65.00	6.24
Back Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.25	1,295	0.0	$151.34	$598.64	$125.00	3.13
CST Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.25	1,295	0.0	$151.34	$598.64	$125.00	3.13
CST Conf. Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
CST Office 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
CST Office 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
CST Office 3	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
Main Office Area	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.62	3,237	0.0	$378.34	$1,091.59	$260.00	2.20
Mail/Copy Room Area	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$379.55	$65.00	6.24
Mail/Copy Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen Area	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
Conference Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
Principal Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
M/W RR 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
M/W RR 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Assistant Principal Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$95.00	3.91
Library	45	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	45	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	1.85	9,711	0.0	$1,135.02	$3,544.76	$815.00	2.41
Library	8	Compact Fluorescent: Pin Base CFL 26 Watt - 2L	Wall Switch	52	3,000	Relamp	Yes	8	LED Screw-In Lamps: Pin-based - 1L	Occupancy Sensor	36	2,100	0.14	732	0.0	$85.55	$463.68	$35.00	5.01
Library	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.25	1,295	0.0	$151.34	$598.64	$125.00	3.13
Library MDF Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$379.55	$65.00	6.24
CR A31	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
Storage 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	400	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	400	0.01	8	0.0	$0.94	$18.26	$5.00	14.09
Storage 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$379.55	$30.00	6.93
Storage 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Storage 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$379.55	$30.00	6.93
CR A54	24	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.98	5,179	0.0	$605.34	$1,854.54	$430.00	2.35
CR A54	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
CR B101	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.25	1,295	0.0	$151.34	$598.64	$125.00	3.13
CR A99	25	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	25	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	1.03	5,395	0.0	$630.57	$1,909.31	$445.00	2.32
CR A99	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
CR B100	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B100 - RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
CR B102	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.33	1,726	0.0	$201.78	$708.18	$155.00	2.74
CR B103	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.33	1,726	0.0	$201.78	$708.18	$155.00	2.74

	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 B104	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B105	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B106	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B107	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B108	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.45	2,374	0.0	$277.45	$872.50	$200.00	2.42
CR B108-RR Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
CR B109	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.45	2,374	0.0	$277.45	$872.50	$200.00	2.42
CR B109 - RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Boys RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.00	14	0.0	$1.61	$36.52	$10.00	16.44
Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.12	647	0.0	$75.67	$434.32	$80.00	4.68
Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,100	0.04	226	0.0	$26.43	$54.77	$50.00	0.18
Girls RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.00	14	0.0	$1.61	$36.52	$10.00	16.44
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.12	647	0.0	$75.67	$434.32	$80.00	4.68
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,100	0.04	226	0.0	$26.43	$54.77	$50.00	0.18
CR B110	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.45	2,374	0.0	$277.45	$872.50	$200.00	2.42
CR B110 - RR/Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Electroical Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.02	114	0.0	$13.31	$36.52	$10.00	1.99
Janitor Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.02	114	0.0	$13.31	$36.52	$10.00	1.99
Womens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Mens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
CR B111	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.45	2,374	0.0	$277.45	$872.50	$200.00	2.42
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
CR B114	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.57	3,021	0.0	$353.12	$1,036.82	$245.00	2.24
CR B114	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 B114 - RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88

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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 B114 - RR	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 B116	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.57	3,021	0.0	$353.12	$1,036.82	$245.00	2.24
CR B116 - RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
CR B116 - RR	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 B118	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.57	3,021	0.0	$353.12	$1,036.82	$245.00	2.24
CR B118 - RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
CR B118 - RR	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 B113	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.45	2,374	0.0	$277.45	$872.50	$200.00	2.42
CR B113 - storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	400	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	400	0.01	8	0.0	$0.94	$18.26	$5.00	14.09
CR B115	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.45	2,374	0.0	$277.45	$872.50	$200.00	2.42
CR B115 - storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	400	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	400	0.01	8	0.0	$0.94	$18.26	$5.00	14.09
CR B120	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.45	2,374	0.0	$277.45	$872.50	$200.00	2.42
CR B120 - RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
CR B 117	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.33	1,726	0.0	$201.78	$708.18	$155.00	2.74
B119	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.12	647	0.0	$75.67	$434.32	$80.00	4.68
CR B122	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.45	2,374	0.0	$277.45	$872.50	$200.00	2.42
CR B122-RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Electrical Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	400	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.04	30	0.0	$3.55	$73.03	$20.00	14.94
CR A50	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.66	3,453	0.0	$403.56	$1,146.36	$275.00	2.16
CR A50-Klin Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$379.55	$65.00	6.24
Supply Room 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.16	863	0.0	$100.89	$489.09	$60.00	4.25
Supply Room 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$379.55	$30.00	6.93
Janitor Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.02	114	0.0	$13.31	$36.52	$10.00	1.99
Stage Area	2	Metal Halide: (1) 175W Lamp	Wall Switch	215	3,000	Relamp	Yes	2	LED Screw-In Lamps: 1 Lamp	Occupancy Sensor	65	2,100	0.22	1,172	0.0	$136.98	$340.36	$35.00	2.23
Stage Area	12	Incandescent: (1) 200W Lamp	Wall Switch	200	3,000	Relamp	Yes	12	LED Screw-In Lamps: 1 Lamp	Occupancy Sensor	45	2,100	1.33	6,976	0.0	$815.35	$692.16	$95.00	0.73

	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
2nd Fl Storage Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.06	342	0.0	$39.92	$109.55	$30.00	1.99
CR B226	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B224	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.25	1,295	0.0	$151.34	$598.64	$125.00	3.13
CR B219	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.25	1,295	0.0	$151.34	$598.64	$125.00	3.13
CR B217	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.33	1,726	0.0	$201.78	$708.18	$155.00	2.74
CR B222	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.33	1,726	0.0	$201.78	$708.18	$155.00	2.74
CR B215	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B220	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B213	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B218	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B211	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B216	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
Mens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Womens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.01	60	0.0	$7.06	$18.26	$5.00	1.88
Janitor Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.02	114	0.0	$13.31	$36.52	$10.00	1.99
CR B214	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.02	114	0.0	$13.31	$36.52	$10.00	1.99
CR B212	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.82	4,316	0.0	$504.45	$1,365.45	$335.00	2.04
Supply Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.08	432	0.0	$50.45	$379.55	$30.00	6.93
CR B210	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.25	1,295	0.0	$151.34	$598.64	$125.00	3.13
Girls RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.00	14	0.0	$1.61	$36.52	$10.00	16.44
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.12	647	0.0	$75.67	$434.32	$80.00	4.68
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,100	0.04	226	0.0	$26.43	$54.77	$50.00	0.18
Boys RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	3,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.00	14	0.0	$1.61	$36.52	$10.00	16.44
Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.12	647	0.0	$75.67	$434.32	$80.00	4.68

	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
Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,100	0.04	226	0.0	$26.43	$54.77	$50.00	0.18
Elec/MDF Room	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	3,000	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.01	28	0.0	$3.23	$73.03	$20.00	16.44
CR B208	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.05	288	0.0	$33.63	$343.03	$55.00	8.56
CR B209	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B206	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B207	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B204	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B205	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B203	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.49	2,590	0.0	$302.67	$927.27	$215.00	2.35
CR B202	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,100	0.37	1,942	0.0	$227.00	$762.95	$170.00	2.61
CR B201	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.08	432	0.0	$50.45	$379.55	$65.00	6.24
Mech Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.17	911	0.0	$106.46	$292.12	$80.00	1.99
Elevator Mech Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,000	0.03	171	0.0	$19.96	$54.77	$15.00	1.99
Exterior Wall Pack Lighting	18	High-Pressure Sodium: (1) 100W Lamp	None	138	3,640	Fixture Replacement	No	18	LED - Fixtures: Wall Sconces	None	41	3,640	1.14	7,279	0.0	$850.73	$4,078.73	$180.00	4.58
Exterior Pendant	6	Metal Halide: (1) 100W Lamp	None	128	3,640	Fixture Replacement	No	6	LED - Fixtures: Downlight Pendant	None	38	3,640	0.35	2,250	0.0	$263.03	$910.59	$30.00	3.35
Pole Lights-Parking Lot	18	High-Pressure Sodium: (1) 100W Lamp	None	138	3,640	Fixture Replacement	No	18	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	None	41	3,640	1.14	7,279	0.0	$850.73	$16,750.15	$900.00	18.63
Pole Lights-Parking Lot	2	Metal Halide: (1) 200W Lamp	None	232	3,640	Fixture Replacement	No	2	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	None	70	3,640	0.21	1,360	0.0	$158.91	$1,861.13	$100.00	11.08
Main Lobby	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,000	0.19	1,025	0.0	$119.76	$328.64	$90.00	1.99
Main Lobby	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.35	1,822	0.0	$212.91	$584.24	$160.00	1.99
Main Lobby	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.09	455	0.0	$53.23	$146.06	$40.00	1.99
Display Cabinets	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.06	342	0.0	$39.92	$109.55	$30.00	1.99
Exit Sign	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
Hallways	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,100	0.82	4,316	0.0	$504.45	$1,695.45	$300.00	2.77
Hallways	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exit Sign	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

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Back Hallway	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,100	0.62	3,237	0.0	$378.34	$1,221.59	$225.00	2.63
Back Hallway CR 122 - 112	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway B112 - 199	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,100	0.74	3,884	0.0	$454.01	$1,585.91	$270.00	2.90
Exit Sign	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallways B101 - Faculty DR	26	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	26	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,100	1.07	5,611	0.0	$655.79	$2,624.09	$390.00	3.41
Exit Signs	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
Stairwell-1	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.03	181	0.0	$21.17	$54.77	$15.00	1.88
Stairwell-1 Exit	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-1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,000	0.13	683	0.0	$79.84	$219.09	$60.00	1.99
2nd Fl. Hallways	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,100	1.23	6,474	0.0	$756.68	$2,643.18	$450.00	2.90
2nd Fl. Hallways	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
Stairwell -2	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,000	0.13	683	0.0	$79.84	$219.09	$60.00	1.99
Stairwell -2	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 -2	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.03	181	0.0	$21.17	$54.77	$15.00	1.88
2nd Fl New Section	10	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	1,680	None	No	10	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	1,680	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
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
Stairwell - 3	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,000	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,000	0.13	683	0.0	$79.84	$219.09	$60.00	1.99
Stairwell - 3	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 - 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.02	121	0.0	$14.11	$36.52	$10.00	1.88
Stairwell - 4	5	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	5	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stairwell - 4	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
First Floor New section	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
First Floor New section	6	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	6	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway Cafeteria	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway Cafeteria	5	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	5	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	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
Desk Service Suite	8	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	8	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Floor Lamps	2	LED Screw-In Lamps: LED - 9.5 W - 1L	Occupancy Sensor	10	2,100	None	No	2	LED Screw-In Lamps: LED - 9.5 W - 1L	Occupancy Sensor	10	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Desk Service Suite	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
Office B128A	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage Room	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen Area	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office B128B	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Electric/Mech C115	1	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	1	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Electrical C114	1	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	1	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C113 Education	3	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	3	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C113 A Office	1	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	1	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C113B Office	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C113 Education	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
Conf Room C112	6	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	6	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Conf Room C111	12	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	12	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mens RR	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mens RR	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Board Office Womens RR	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Board Office Womens RR	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage Room	6	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	6	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage Room	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
C102B Kitchen	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C102	43	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	43	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C102	21	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	21	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C102	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
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C102A Storage	4	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	4	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C101 Meeting Room	45	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	45	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C101 Meeting Room	21	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	21	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C101 Meeting Room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
c102&c101	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	5	2,100	None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Board Office Lobby Area	71	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	71	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Board Office Lobby Area	35	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	5	2,100	None	No	35	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Board Office Lobby Area	6	LED - Linear Tubes: (1) 8' Lamp	Occupancy Sensor	5	2,100	None	No	6	LED - Linear Tubes: (1) 8' Lamp	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Board Office Lobby Area	3	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	None	No	3	LED Screw-In Lamps: LED - 5 W - 1L	Occupancy Sensor	5	2,100	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Display Cabinet	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	2,400	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	2,400	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C105 Space Service	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C105 Space Service	12	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	12	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C105 C - Work Room	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office C105B	4	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	4	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office C105C	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office C105D	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office C105E	4	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	4	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office C105F	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office C105G	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Interview Room C105A	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C105A1	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
C105A1	1	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	1	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
M/W RR	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Staff Room C104	4	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	4	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office C103	33	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	33	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

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2nd Fl Open Area	3	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	3	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Fl Open Area	14	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	14	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Fl Open Area	24	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	24	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Fl Mens RR	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Fl Mens RR	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Fl Womens RR	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Fl Womens RR	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	2	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Elec Room C225	1	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	1	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
HR Area	44	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	44	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
HR Area	36	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	36	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
HR Area	8	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	8	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
HR Area	12	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	12	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
HR Area	16	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	None	No	16	LED Screw-In Lamps: LED - 5 W - 1L	Wall Switch	5	3,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
SGI B119	Room - Fan Coil	1	Supply Fan	0.2	69.5%	No	3,020	No	69.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Fl Storage Room	AHU 3	1	Supply Fan	5.0	89.5%	Yes	3,020	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
B201 Mechanical Room	AHU 4	1	Supply Fan	5.0	89.5%	No	3,020	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Exhaust Fan 4 - Hallway 226	1	Exhaust Fan	0.3	69.5%	No	3,020	No	69.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Exhaust Fan 5 - 1st FL Student Bathroom	1	Exhaust Fan	0.3	69.5%	No	3,020	No	69.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Exhaust Fan 6 - 2nd Fl Student Bathroom	1	Exhaust Fan	0.3	69.5%	No	3,020	No	69.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Fl Mech Room	Exhaust Fan 1	6	Exhaust Fan	5.0	85.5%	No	3,020	Yes	89.5%	No		0.69	2,826	0.0	$330.29	$4,802.22	$0.00	14.54
Elevator Room	Elevator	1	Other	20.0	72.0%	No	900	No	72.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Elevator Room - C115	Elevator	1	Other	20.0	72.0%	No	900	No	72.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Cooling Tower	3	Cooling Tower Fan	10.0	89.5%	No	3,391	Yes	91.7%	Yes	3	9.07	32,913	0.0	$3,846.95	$15,454.50	$2,400.00	3.39
Rooftop	EF-1	1	Exhaust Fan	0.8	81.8%	No	3,020	No	81.8%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Chiller Water Supply	2	Chilled Water Pump	10.0	86.5%	No	4,067	Yes	91.7%	Yes	2	3.14	33,568	0.0	$3,923.45	$10,303.00	$0.00	2.63
Boiler Room	Chiller Water Return	3	Chilled Water Pump	30.0	92.4%	No	4,067	Yes	94.1%	Yes	3	12.17	138,487	0.0	$16,186.50	$34,726.50	$5,400.00	1.81
Boiler Room	Hot Water	2	Heating Hot Water Pump	5.0	87.5%	No	2,745	Yes	89.5%	Yes	2	1.44	10,993	0.0	$1,284.86	$8,152.44	$0.00	6.34
Rooftop	New Section - Classroom	1	Supply Fan	5.0	89.5%	No	3,020	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	New Section - Classroom	1	Return Fan	5.0	89.5%	No	3,020	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	New Section	1	Supply Fan	0.2	69.5%	No	3,020	No	69.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	New Section	1	Return Fan	0.1	69.5%	No	3,020	No	69.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	New Section	1	Return Fan	0.1	69.5%	No	3,020	No	69.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	New Section Board Room	1	Supply Fan	5.0	89.5%	No	3,020	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Rooftop	New Section Board Room	1	Return Fan	5.0	89.5%	No	3,020	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	New Section Board Room	2	Supply Fan	5.0	87.5%	No	3,020	Yes	89.5%	Yes	2	3.09	9,978	0.0	$1,166.25	$8,152.44	$800.00	6.30
Boiler Room	AHU1A	1	Supply Fan	3.0	86.5%	No	3,020	Yes	89.5%	Yes	1	0.48	1,638	0.0	$191.48	$3,884.01	$0.00	20.28
Boiler Room	AHU 1	1	Supply Fan	3.0	86.5%	No	3,020	Yes	89.5%	Yes	1	0.48	1,638	0.0	$191.48	$3,884.01	$0.00	20.28
Boiler Room	AHU 2	1	Supply Fan	5.0	87.5%	No	3,020	Yes	89.5%	Yes	1	0.77	2,623	0.0	$306.61	$4,076.22	$775.00	10.77
Class Rooms	Class Room Fan Coil Units	60	Supply Fan	0.3	69.5%	No	3,020	No	69.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	RF2	1	Return Fan	3.0	86.5%	No	3,020	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Fl Storage Room	RF3	1	Return Fan	3.0	86.5%	No	3,020	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

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
Roof	Walkins	2	Split-System AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Computer Lab B212	1	Split-System AC	4.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	First Fl Room - B119	1	Ductless Mini-Split AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	New Section - Classroom	1	Packaged AC	15.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	New Section	1	Ductless Mini-Split AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	New Section	1	Ductless Mini-Split AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	New Section Board Room	1	Packaged AC	15.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	New Section Board Room	2	Packaged AC	7.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	C225	1	Ductless Mini-Split AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric Chiller Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	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
Old Section Boiler Room	Whole Building	1	Water-Cooled Centrifugal Chiller	325.00	No							0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Old Section Boiler Room	Old Section	2	Non-Condensing Hot Water Boiler	1,656.00	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
Old Section Boiler Room	Whole Building -DHW	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)	Yes	No	No	0.02	308	0.0	$35.95	$303.30	$0.00	8.44

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	3	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Self-Contained Unit (<175 lbs/day), Continuous	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	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 - 28 Pans)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Electric Convection Oven (Full Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Gas Rack Oven (Single)	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?
Computer Lab	80	Desktops	120.0	No
Class room and Office	29	Desk Printer	80.0	No
Class room and various	49	Projector	287.0	No
Various	10	TV	40.0	No
Various	11	Photo Coppier	335.0	No
Various	18	Microwave	800.0	No
Various	7	Coffee Maker	900.0	No
Various	8	Mini Fridge	75.0	No
Various	6	Refrigerator	150.0	No
Various	4	Water Cooler	75.0	No
Art	1	Kiln	10,000.0	No

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Teacher's Lounge	2	Refrigerated	Yes	0.00	3,224	0.0	$376.79	$460.00	$0.00	1.22

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Village Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 145,000
Built: 1995

For Year Ending: November 30, 2017
Date Generated: February 20, 2019

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 Elementary School 601 New Village West Windsor, New Jersey 08550	West Windsor - Plainsboro Regional School District 321 VIllage Rd E West Windsor, NJ 08550 (____)____-_____	Smruti Srinivasan 321 VIllage Rd E West Windsor, NJ 08550 7328552897 ssrinivasan@trcsolutions.com

Property ID: 6389367

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
75.9 kBtu/ft²

Source EUI
152.7 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	6,052,652 (55%)
Natural Gas (kBtu)	4,951,091 (45%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	53.8
National Median Source EUI (kBtu/ft²)	108.3
% Diff from National Median Source EUI	41%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	876

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

Smruti Srinivasan
321 VIllage Rd E
West Windsor, NJ 08550
7328552897
ssrinivasan@trcsolutions.com

Professional Engineer Stamp
(if applicable)