Local Government Energy Audit:
Energy Audit Report

Whiton Elementary School

Branchburg Township School District

470 Whiton Road
Neshanic Station, NJ 08853

January 5, 2018

Final Report by:
TRC Energy Services

Disclaimer

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

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

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

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

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1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Whiton Elementary School. The goal of an LGEA report is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and provide information and assistance to help facilities implement ECMs. The LGEA report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

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

1.1 Facility Summary

Whiton Elementary School is a 90,321 square foot facility comprised of three (3) wings (A, B, and C), which are connected by hallways. The single-story building includes a gym, kitchen, media room, art room, offices and classrooms. The school was constructed in 1997 and renovated in 2002. There is also a 75 kW solar photovoltaic (PV) system on the roof of the facility.

Lighting at Whiton Elementary School consists of primarily first generation T8 fluorescents mixed with some LEDs in hallways or corridor spaces in the interior, and high intensity discharge (HID) lighting on the exterior of the building. Some of the HVAC equipment is in poor condition and in need of replacement. Cooling and heating is supplied mostly from split heat pump units and package units. 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 eight (8) measures which together represent an opportunity for Whiton Elementary School to reduce annual energy costs by $34,833 and annual greenhouse gas emissions by 296,700 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 12.4 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 Whiton Elementary School's annual energy use by 14.6%.

Figure 1 – Previous 12 Month Utility Costs

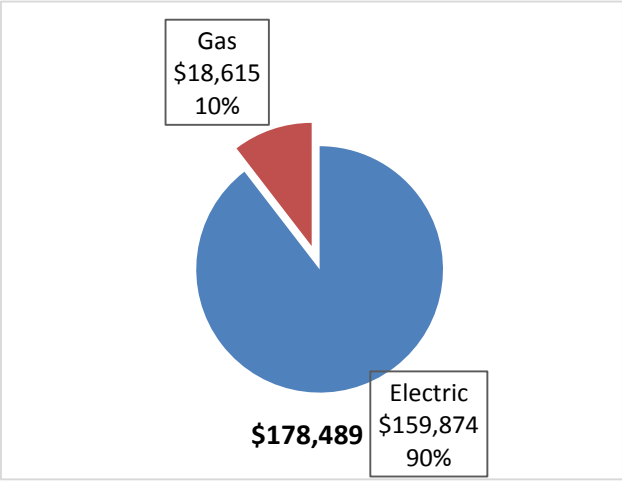
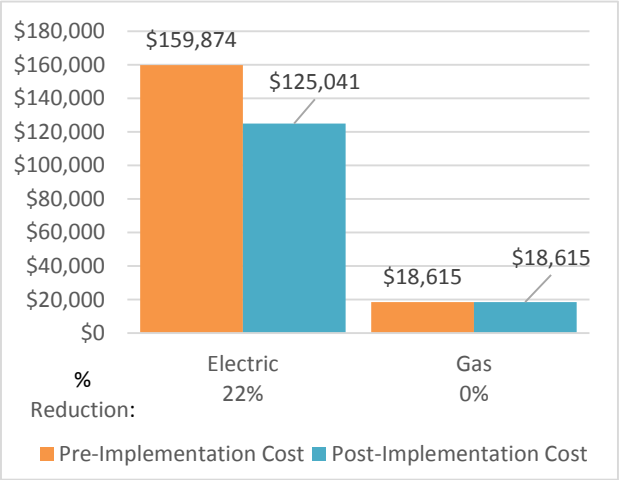


Figure 2 – Potential Post-Implementation Costs



A detailed description of Whiton 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			**168,410**	**40.3**	**0.0**	**$19,909.89**	**$94,791.00**	**$18,375.00**	**$76,416.00**	**3.8**	**169,588**
ECM 1	Install LED Fixtures	Yes	26,112	3.4	0.0	$3,087.01	$11,344.87	$1,900.00	$9,444.87	3.1	26,294
ECM 2	Retrofit Fixtures with LED Lamps	Yes	131,338	36.1	0.0	$15,527.10	$80,004.37	$16,475.00	$63,529.37	4.1	132,256
ECM 3	Install LED Exit Signs	Yes	10,961	0.7	0.0	$1,295.78	$3,441.76	$0.00	$3,441.76	2.7	11,037
Lighting Control Measures			**29,754**	**7.9**	**0.0**	**$3,517.66**	**$25,112.00**	**$2,635.00**	**$22,477.00**	**6.4**	**29,963**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	29,754	7.9	0.0	$3,517.66	$25,112.00	$2,635.00	$22,477.00	6.4	29,963
Motor Upgrades			**706**	**0.2**	**0.0**	**$83.47**	**$3,201.48**	**$0.00**	**$3,201.48**	**38.4**	**711**
ECM 5	Premium Efficiency Motors	Yes	706	0.2	0.0	$83.47	$3,201.48	$0.00	$3,201.48	38.4	711
Variable Frequency Drive (VFD) Measures			**14,071**	**2.6**	**0.0**	**$1,663.54**	**$13,103.40**	**$800.00**	**$12,303.40**	**7.4**	**14,170**
ECM 6	Install VFDs on Constant Volume (CV) HVAC	Yes	4,118	1.4	0.0	$486.89	$6,551.70	$800.00	$5,751.70	11.8	4,147
ECM 7	Install VFDs on Hot Water Pumps	Yes	9,953	1.3	0.0	$1,176.65	$6,551.70	$0.00	$6,551.70	5.6	10,022
Electric Unitary HVAC Measures			**79,743**	**38.4**	**0.0**	**$9,427.46**	**$336,190.10**	**$18,748.00**	**$317,442.10**	**33.7**	**80,301**
	Install High Efficiency Electric AC	No	10,963	6.5	0.0	$1,296.07	$53,057.96	$3,388.50	$49,669.46	38.3	11,040
	Install High Efficiency Heat Pumps	No	68,780	31.9	0.0	$8,131.39	$283,132.14	$15,359.50	$267,772.64	32.9	69,261
Plug Load Equipment Control - Vending Machine			**1,954**	**0.0**	**0.0**	**$231.05**	**$460.00**	**$0.00**	**$460.00**	**2.0**	**1,968**
ECM 8	Vending Machine Control	Yes	1,954	0.0	0.0	$231.05	$460.00	$0.00	$460.00	2.0	1,968
TOTALS			**294,639**	**89.4**	**0.0**	**$34,833.07**	**$472,857.98**	**$40,558.00**	**$432,299.98**	**12.4**	**296,700**

* - 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).

TOTALS (Recommended Measures)	214,896	51.0	0	$25,405.61	$136,667.88	$21,810.00	$114,857.88	4.5	216,399

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 (IHP 2014). Motors replacements generally assume the same size motors, just higher efficiency. Although occasionally additional savings can be achieved by downsizing motors to better meet current load requirements. This measure saves energy by reducing the power used by the motors, due to improved electrical efficiency.

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

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

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 outlets when not in use.

Energy Efficient Practices

TRC also identified 12 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 Whiton Elementary School include:

- Close Doors and Windows
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Use Fans to Reduce Cooling Load
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Check for and Seal Duct Leakage
- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Install Plug Load Controls
- Replace Computer Monitors

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

On-Site Generation Measures

TRC evaluated the potential for installing additional on-site generation for Whiton Elementary School. Based on the configuration of the site and its loads, there is a moderate potential for installing another photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	Medium	
System Potential	300	kW DC STC
Electric Generation	357,411	kWh/yr
Displaced Cost	$31,090	/yr
Installed Cost	$1,092,000	

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
- Pay for Performance - Existing Building (P4P)
- Energy Savings Improvement Program (ESIP)

For facilities wanting to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate in this program you may utilize internal resources, or an outside firm or contractor, to do the final design of the ECM(s) and do the installation. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation. The incentive estimates listed above in Figure 3 are based on the SmartStart program. More details on this program and others are available in Section 7.

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

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support

services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 7.4 for additional information on the ESIP Program.

Additional information on relevant incentive programs is located in Section 7 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			
Theresa Linskey	Business Administrator	Tlinskey@Branchburg.k12.nj.us	908-722-3335 Ext. 4740
Designated Representative			
John T. Hindmarch	Supervisor of Buildings and Grounds at Branchburg Township School District	jhindmarch@branchburg.k12.nj.us	908-722-3335 0x1630
TRC Energy Services			
Moussa Traore	Auditor	MTraore@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On April 4, 2017, TRC performed an energy audit at Whiton Elementary School located in Neshanic Station, New Jersey. TRC's auditor met with John T. Hindmarch, Supervisor of Buildings and Grounds to review the facility operations and help focus our investigation on specific energy-using systems.

Whiton Elementary School is a 90,321 square foot facility comprised of three wings (A, B, and C) connected by hallways. The single-story building includes a gym, kitchen, media room, art room, offices and classrooms. There is also a 75 kW solar photovoltaic (PV) system on the roof of the facility.

The school was constructed in 1997 and renovated in 2002.

2.3 Building Occupancy

The school building is open Monday through Friday and closed on the weekends. The typical schedule is presented in the table below. The entire facility is used September through mid-June and is closed to students for the summer months (mid-June to beginning of September). During a typical day, the facility is occupied by approximately 36 staff members and 664 students.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Whiton Elementary School	Weekday	8:00 AM - 5:30 PM
Whiton Elementary School	Weekend	closed

2.4 Building Envelope

The building is constructed of concrete block and structural steel with a brick façade and has pitched roofs covered with composite shingle tiles. There are double pane windows throughout the facility that showed little signs of excessive air infiltration. All of the exterior doors are constructed of metal. Overall, the building's envelope was found to be in good condition.




2.5 On-Site Generation

Whiton Elementary School has an existing 75 kW solar photovoltaic (PV) system installed on the roof. The system provides 8% of the electricity required by the facility. Vanguard Energy Capital LLC, a national power-purchase agreement provider, was the financier of the solar energy system.

2.6 Energy-Using Systems

Lighting System

Lighting at the facility is provided mostly by linear 32-watt 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. There are LED linear tube fixtures installed in the A, B and C wing corridors. There is an LED upgrade in progress in this building and the project is approved to receive an incentive from the SmartStart Prescriptive Lighting program.

Lighting control in most spaces is provided by manual wall switches. There are occupancy sensors in some of the gym rooms.

The building's exterior lighting is minimal and consists primarily of 215 watt metal halide and high pressure sodium vapor fixtures that are controlled by photocells.

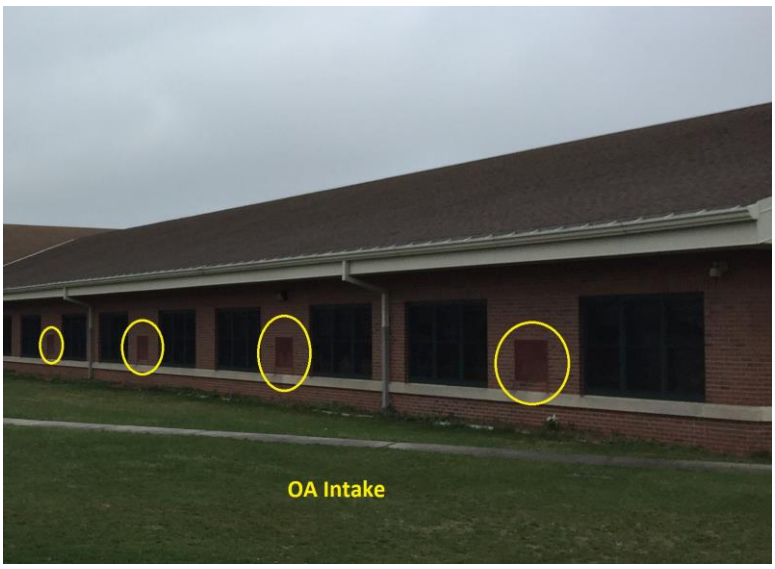
Please see Appendix A: Equipment Inventory & Recommendations for an inventory of the facility's lighting equipment.

Hot Water Heating System

The hot water system consists of two (2) Aerco KC Series condensing boilers with an output capacity of 800 kBtu/hr and each with a net efficiency of 93%. The boilers are configured in a constant flow primary distribution with two (2) 5 hp hot water pumps (Pump 1 & Pump 2) to serve the hot water coil of the unit ventilators and air handlers. There are six (6) unit ventilators that are equipped with hot coils for heating and DX coils for cooling and dehumidification. They serve classrooms B6, B6A, C6, C6A, C7, and C7B. The boilers operate in a lead/lag configuration and both may be required during colder weather. They are enabled when the outside air temperature is below 60^{o}F.

Direct Expansion Air Conditioning System (DX)

There are 38 4-ton Airedale air source heat pumps with supplemental electric resistance heating used to condition the classroom spaces. The units are constant air volume with a single 2 hp evaporator (supply) fan and single 2 hp condenser fan. The system has the ability to provide free cooling via the outdoor air damper that can modulate the amount of outside air from 0 to 100%. The units use a scroll compressor and a direct-expansion (DX) coil. The units have 15 kW electric resistance supplemental heating that is used as needed – typically when the outside air temperature is below 40°F. The units are controlled by individual thermostats located in the zones. The heat pumps are connected to the building's energy management system and enabled based on building occupancy.



Three (3) 15 ton Trane split AC units with gas-fired furnaces condition the gymnasium. The condenser units are located on the east end of the building and provide constant air volume.

Two (2) 30-ton package units with gas-fired furnaces are located on the roofs above the cafeteria (RTU-2) and the B/C wing (RTU-1, South end of building). RTU-1 (above the classrooms) provides a variable air volume to the classrooms below while RTU-2 (above the cafeteria) provides a constant air volume to the cafeteria.

There are several other smaller split AC and heat pump units ranging in capacity from 1 to 7.5 tons serving server rooms, library, offices, and various other small rooms. A few of these units were indicated as needing replacement.

Building Energy Management System (BEMS)

The majority of the facility is monitored and controlled with a Metasys Building Energy Management System (BEMS). The BEMS system mainly provides schedule and setpoint controls for the building's HVAC systems and heating hot water.

Domestic Hot Water Heating System

The domestic hot water (DHW) system for the facility consists of three (3) gas water heaters. The gas water heaters serve the kitchen and restrooms. Two (2) units have an input capacity of 42 kBtu/hr and one has an input capacity of 200 kBtu/hr with storage tanks ranging in capacity from 50 to 100 gallons. They all appeared to be in good condition.

Food Service

The school has a small, non-commercial kitchen that is used to prepare approximately 700 lunches per day for the students and staff. Most of the lunch preparation is done using the natural gas-fired convection ovens and warmers which are already deemed to be energy efficient equipment.

Refrigeration

The kitchen has a two (2) coolers, three (3) freezers, and five (5) stand up refrigerators used to store food prepared for school lunches. The kitchen also has a free standing commercial size freezer.

Building Plug Load

There are approximately 174 desktop computers, 107 small printers, 12 large printers, seven (7) refrigerators and seven (7) water fountains located throughout the facility. There is also an 11.5 kW kiln in the art room. The facility has one (1) refrigerated beverage vending machine and one (1) non-refrigerated beverage vending machine, both without energy-savings controls.

2.7 Water-Using Systems

There are 17 restrooms at this facility. A sampling of restrooms found that faucets are rated for 2.2 gallons per minute (gpm) or higher, the toilets are rated at 2.5 gallons per flush (gpf) and the urinals are rated at 2 gpf. The faucets in the students' restrooms are motion sensor controlled.

3 SITE ENERGY USE AND COSTS

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

3.1 Total Cost of Energy

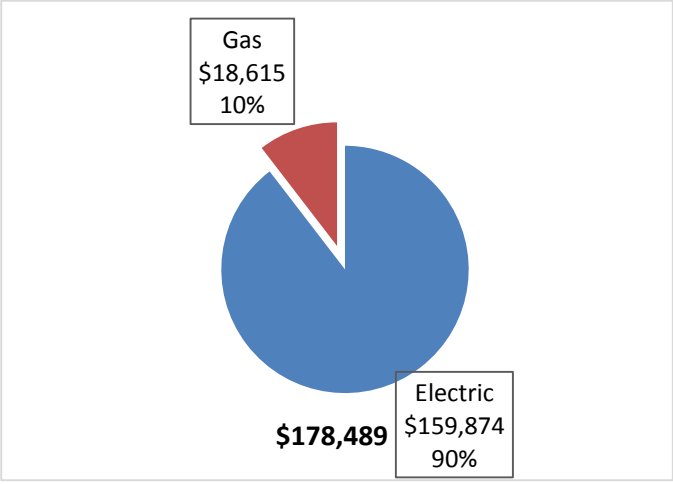
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Whiton Elementary School		
Fuel	**Usage**	**Cost**
Electricity	1,352,312 kWh	$159,874
Natural Gas	22,591 Therms	$18,615
Total		**$178,489**

The current annual energy cost for this facility is $178,489 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by JCP&L. The average electric cost over the past 12 months was $0.118/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. There are significant demand charges for the school. The demand should be further investigated as the base kW does not appear to go below 300kW for most months. Analysis of the energy and demand profile indicates that there is a higher energy and demand in the winter months with respect to the summer which makes sense as the majority of the space heating is electric. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 9 - Electric Usage & Demand

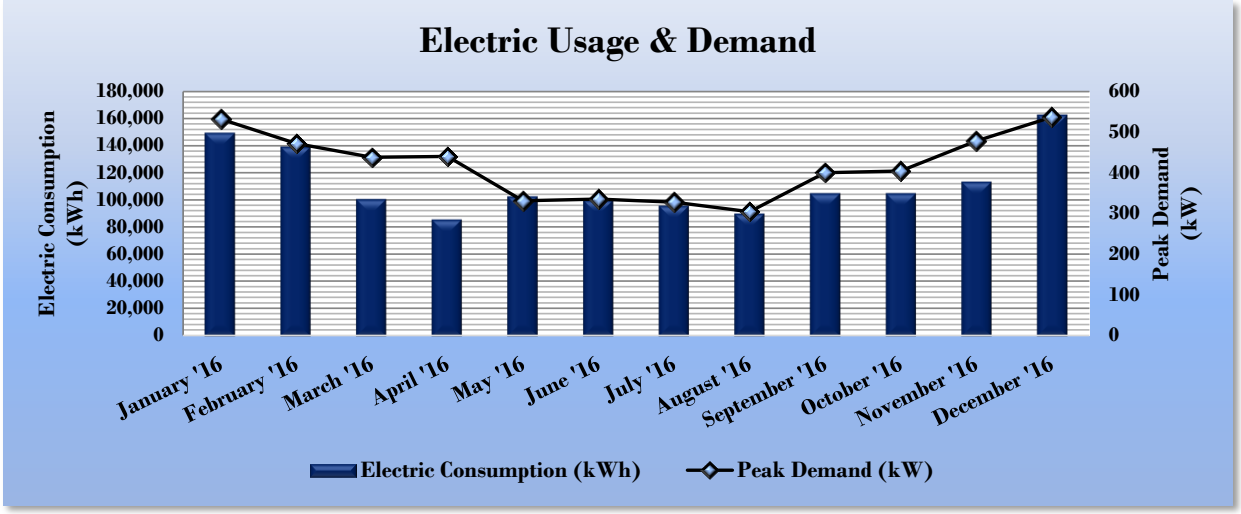


Figure 10 -Electric Usage & Demand

Electric Billing Data for Whiton Elementary School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
2/3/16	29	149,183	532	$2,985	$17,594
3/3/16	29	139,086	472	$2,646	$16,246
4/4/16	32	100,556	438	$2,457	$12,076
4/29/16	25	85,625	440	$2,058	$10,153
6/1/16	33	102,727	331	$1,992	$11,817
7/1/16	30	99,879	335	$2,015	$11,476
8/1/16	31	95,819	328	$1,971	$11,061
8/30/16	29	89,952	304	$1,826	$10,363
9/29/16	30	104,928	400	$2,245	$12,584
11/1/16	33	104,881	404	$2,265	$12,650
12/1/16	30	113,381	478	$2,680	$13,980
1/3/17	33	162,590	537	$2,740	$19,436
Totals	**364**	**1,348,607**	**537**	**$27,880**	**$159,436**
Annual	**365**	**1,352,312**	**537**	**$27,957**	**$159,874**

3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is $0.824/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 11 - Natural Gas Usage

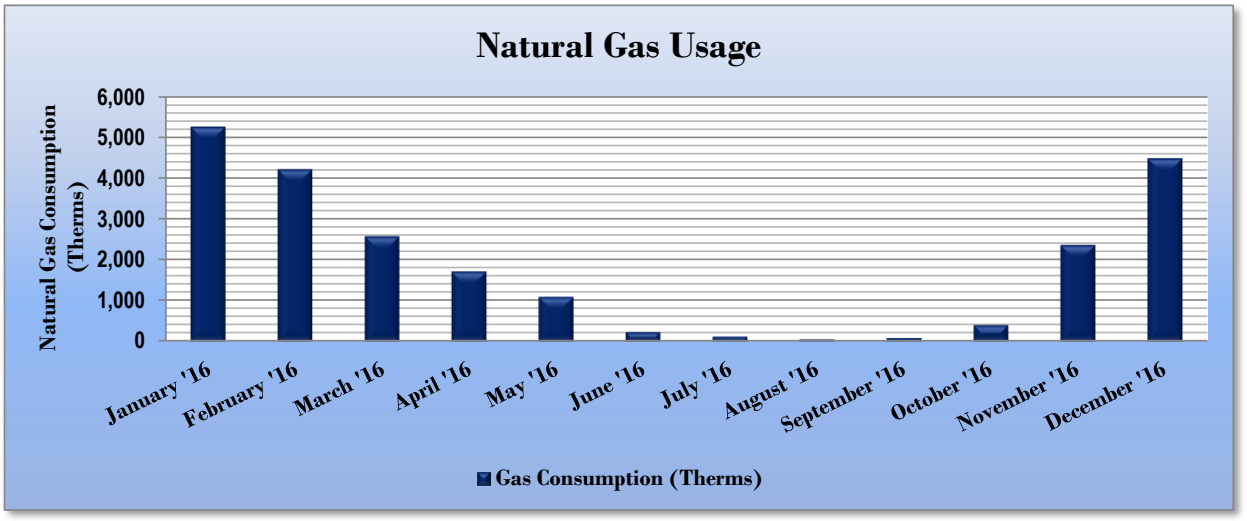


Figure 12 - Natural Gas Usage

Gas Billing Data for Whiton Elementary School				
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost	TRC Estimated Usage?
1/27/16	29	5,248	$4,314	No
2/24/16	29	4,206	$3,266.00	No
3/28/16	32	2,575	$2,098	No
4/25/16	25	1,711	$965	No
5/25/16	33	1,091	$667	No
6/23/16	30	228	$224	No
7/25/16	31	114	$175	No
8/23/16	29	43	$133	No
9/22/16	30	77	$153	No
10/24/16	33	400	$355	No
11/22/16	30	2,359	$2,144	Yes
12/22/16	33	4,478	$4,070	No
Totals	**364**	**22,530**	**$18,564**	
Annual	**365**	**22,591**	**$18,615**	

3.4 Benchmarking

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

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

Figure 13 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Whiton Elementary School	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	186.7	148.1
Site Energy Use Intensity (kBtu/ft^2)	76.1	67.3

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

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

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Whiton Elementary School	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	161.2	148.1
Site Energy Use Intensity (kBtu/ft^2)	68.0	67.3

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. Your building is eligible to receive a score. This facility has a current score of 64.

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

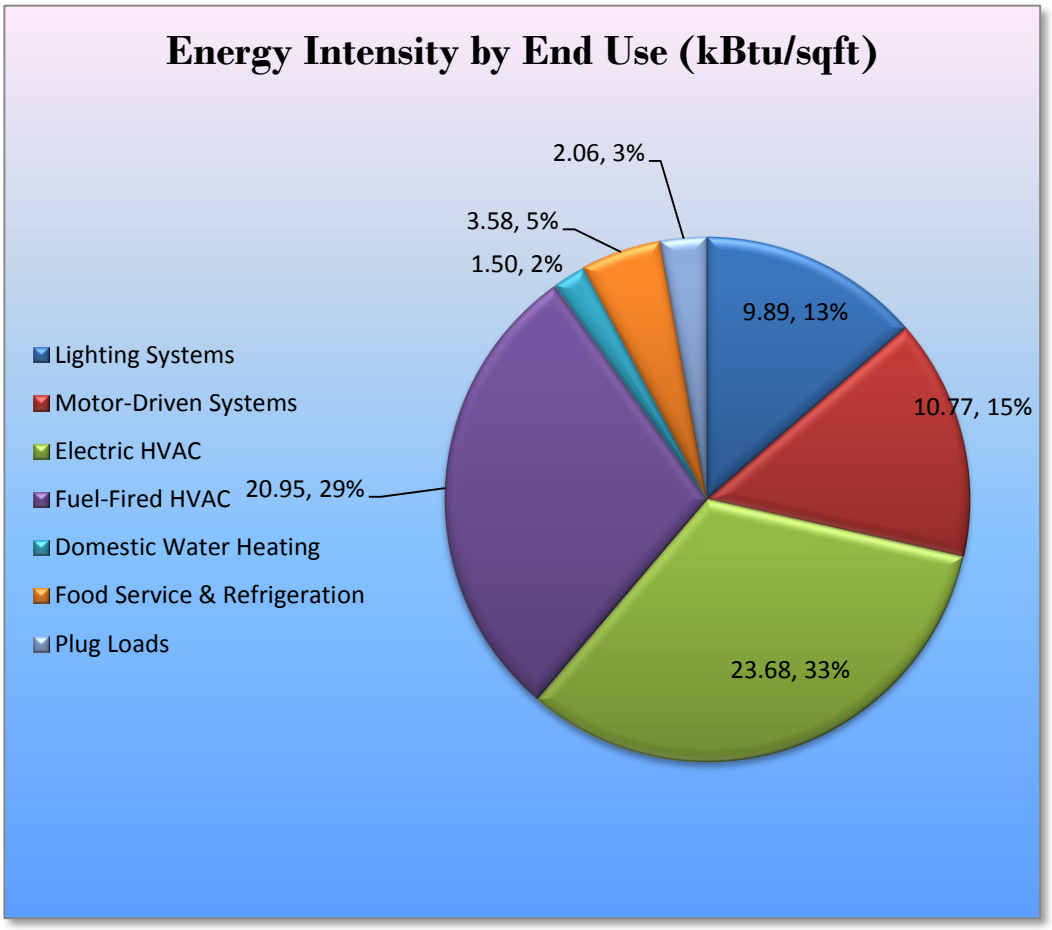
For more information on ENERGY STAR® certification go to:
https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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

3.5 Energy End-Use Breakdown

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

Figure 15 - Energy Balance (% and kBtu/SF)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Whiton 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 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 7.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 16 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**168,410**	**40.3**	**0.0**	**$19,909.89**	**$94,791.00**	**$18,375.00**	**$76,416.00**	**3.8**	**169,588**
ECM 1	Install LED Fixtures	26,112	3.4	0.0	$3,087.01	$11,344.87	$1,900.00	$9,444.87	3.1	26,294
ECM 2	Retrofit Fixtures with LED Lamps	131,338	36.1	0.0	$15,527.10	$80,004.37	$16,475.00	$63,529.37	4.1	132,256
ECM 3	Install LED Exit Signs	10,961	0.7	0.0	$1,295.78	$3,441.76	$0.00	$3,441.76	2.7	11,037
Lighting Control Measures		**29,754**	**7.9**	**0.0**	**$3,517.66**	**$25,112.00**	**$2,635.00**	**$22,477.00**	**6.4**	**29,963**
ECM 4	Install Occupancy Sensor Lighting Controls	29,754	7.9	0.0	$3,517.66	$25,112.00	$2,635.00	$22,477.00	6.4	29,963
Motor Upgrades		**706**	**0.2**	**0.0**	**$83.47**	**$3,201.48**	**$0.00**	**$3,201.48**	**38.4**	**711**
ECM 5	Premium Efficiency Motors	706	0.2	0.0	$83.47	$3,201.48	$0.00	$3,201.48	38.4	711
Variable Frequency Drive (VFD) Measures		**14,071**	**2.6**	**0.0**	**$1,663.54**	**$13,103.40**	**$800.00**	**$12,303.40**	**7.4**	**14,170**
ECM 6	Install VFDs on Constant Volume (CV) HVAC	4,118	1.4	0.0	$486.89	$6,551.70	$800.00	$5,751.70	11.8	4,147
ECM 7	Install VFDs on Hot Water Pumps	9,953	1.3	0.0	$1,176.65	$6,551.70	$0.00	$6,551.70	5.6	10,022
Plug Load Equipment Control - Vending Machine		**1,954**	**0.0**	**0.0**	**$231.05**	**$460.00**	**$0.00**	**$460.00**	**2.0**	**1,968**
ECM 8	Vending Machine Control	1,954	0.0	0.0	$231.05	$460.00	$0.00	$460.00	2.0	1,968
TOTALS		**214,896**	**51.0**	**0.0**	**$25,405.61**	**$136,667.88**	**$21,810.00**	**$114,857.88**	**4.5**	**216,399**

* - 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

Recommended upgrades to existing lighting fixtures are summarized in Figure 17 below.

Figure 17 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**168,410**	**40.3**	**0.0**	**$19,909.89**	**$94,791.00**	**$18,375.00**	**$76,416.00**	**3.8**	**169,588**
ECM 1	Install LED Fixtures	26,112	3.4	0.0	$3,087.01	$11,344.87	$1,900.00	$9,444.87	3.1	26,294
ECM 2	Retrofit Fixtures with LED Lamps	131,338	36.1	0.0	$15,527.10	$80,004.37	$16,475.00	$63,529.37	4.1	132,256
ECM 3	Install LED Exit Signs	10,961	0.7	0.0	$1,295.78	$3,441.76	$0.00	$3,441.76	2.7	11,037

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	26,112	3.4	0.0	$3,087.01	$11,344.87	$1,900.00	$9,444.87	3.1	26,294

Measure Description

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

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	131,338	36.1	0.0	$15,527.10	$80,004.37	$16,475.00	$63,529.37	4.1	132,256
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

ECM 3: Install LED EXIT Signs

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	10,961	0.7	0.0	$1,295.78	$3,441.76	$0.00	$3,441.76	2.7	11,037
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

4.1.2 Lighting Control Measures

Figure 18 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**29,754**	**7.9**	**0.0**	**$3,517.66**	**$25,112.00**	**$2,635.00**	**$22,477.00**	**6.4**	**29,963**
ECM 4	Install Occupancy Sensor Lighting Controls	29,754	7.9	0.0	$3,517.66	$25,112.00	$2,635.00	$22,477.00	6.4	29,963

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

ECM 4: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
29,754	7.9	0.0	$3,517.66	$25,112.00	$2,635.00	$22,477.00	6.4	29,963

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in all restrooms, storage rooms, classrooms, offices areas, etc. 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.

4.1.3 Motor Upgrades

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)
706	0.2	0.0	$83.47	$3,201.48	$0.00	$3,201.48	38.4	711

Measure Description

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

4.1.4 Variable Frequency Drive Measures

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

Figure 19 – Summary of Variable Frequency Drive ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**14,071**	**2.6**	**0.0**	**$1,663.54**	**$13,103.40**	**$800.00**	**$12,303.40**	**7.4**	**14,170**
ECM 6	Install VFDs on Constant Volume (CV) HVAC	4,118	1.4	0.0	$486.89	$6,551.70	$800.00	$5,751.70	11.8	4,147
ECM 7	Install VFDs on Hot Water Pumps	9,953	1.3	0.0	$1,176.65	$6,551.70	$0.00	$6,551.70	5.6	10,022

ECM 6: 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)
4,118	1.4	0.0	$486.89	$6,551.70	$800.00	$5,751.70	11.8	4,147

Measure Description

We recommend installing variable frequency drives (VFDs) on the Gymnasium air handler units 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.

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 7: Install VFDs on Hot Water Pumps

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
9,953	1.3	0.0	$1,176.65	$6,551.70	$0.00	$6,551.70	5.6	10,022

Measure Description

We recommend installing variable frequency drives (VFD) to control the two (2) 5 hp hot water pumps for the heating hot water boiler. 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 result 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. If 3-way valves are currently present, additional work (and cost) will be required to reconfigure the system.

4.1.5 Plug Load Equipment Control - Vending Machines

ECM 8: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,954	0.0	0.0	$231.05	$460.00	$0.00	$460.00	2.0	1,968

Measure Description

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

4.2 ECMs Evaluated But Not Recommended

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

Figure 20 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures	**79,743**	**38.4**	**0.0**	**$9,427.46**	**$336,190.10**	**$18,748.00**	**$317,442.10**	**33.7**	**80,301**
Install High Efficiency Electric AC	10,963	6.5	0.0	$1,296.07	$53,057.96	$3,388.50	$49,669.46	38.3	11,040
Install High Efficiency Heat Pumps	68,780	31.9	0.0	$8,131.39	$283,132.14	$15,359.50	$267,772.64	32.9	69,261
TOTALS	**79,743**	**38.4**	**0.0**	**$9,427.46**	**$336,190.10**	**$18,748.00**	**$317,442.10**	**33.7**	**80,301**

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

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

Install High Efficiency Air Conditioning Units

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
10,963	6.5	0.0	$1,296.07	$53,057.96	$3,388.50	$49,669.46	38.3	11,040

Measure Description

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

Reasons for not Recommending

Although there are energy savings with replacing the air conditioning units we identified, the installation costs outweigh the cost savings. The economics of replacing the units to save energy cannot be justified on energy savings alone and therefore are not currently recommended.

Install High Efficiency Heat 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)
68,780	31.9	0.0	$8,131.39	$283,132.14	$15,359.50	$267,772.64	32.9	69,261

Measure Description

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

Reasons for not Recommending

Although there most likely will be energy savings with the replacement of the heat pump units we identified, the installation costs outweigh the cost savings. The economics of replacing the units to save energy cannot be justified based on energy savings alone and therefore are not currently recommended for replacement.

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.

Close Doors and Windows

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

Perform Proper Lighting Maintenance

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

Develop a Lighting Maintenance Schedule

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

Ensure Lighting Controls Are Operating Properly

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

Use Fans to Reduce Cooling Load

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

Clean Evaporator/Condenser Coils on AC Systems

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

Clean and/or Replace HVAC Filters

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

Check for and Seal Duct Leakage

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

Perform Proper Boiler Maintenance

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

Perform Proper Water Heater Maintenance

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

Plug Load Controls

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

Replace Computer Monitors

Replacing old computer monitors or displays with efficient monitors will reduce energy use. ENERGY STAR® rated monitors have specific requirements for on mode power consumption as well as idle and sleep mode power. According to the ENERGY STAR® website monitors that have earned the ENERGY STAR® label are 25% more efficient than standard monitors.

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.

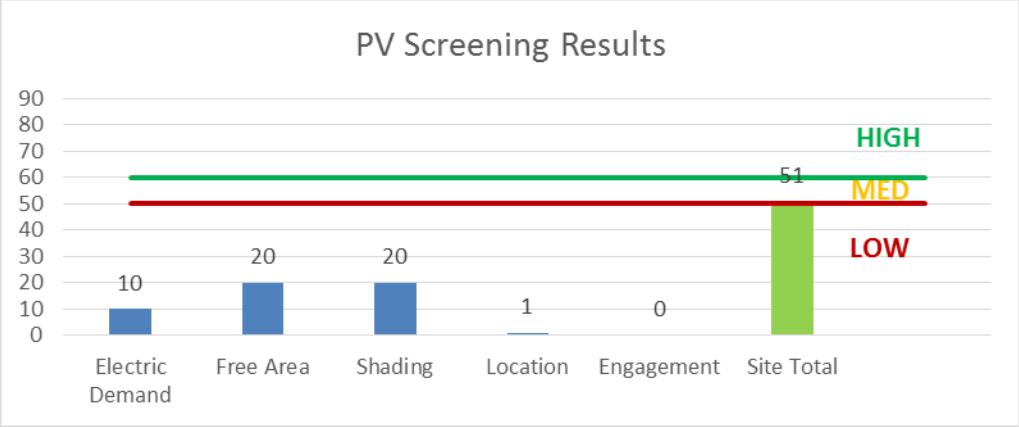
The State of New Jersey's Energy Master Plan (EMP) encourages new distributed generation of all forms and specifically focuses on expanding use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines 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

The Whiton Elementary School has a 75 kW solar photovoltaic (PV) system installed on the roof. The systems provides 7% of the electricity required by the facility. 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 medium potential for installing an additional PV array.

Figure** 21 - **Photovoltaic Screening



Solar projects must register their projects in the SREC Registration Program prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about developed new solar projects and insight into future SREC pricing. Refer to Section 7.3 for additional information.

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

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

6.2 Combined Heat and Power

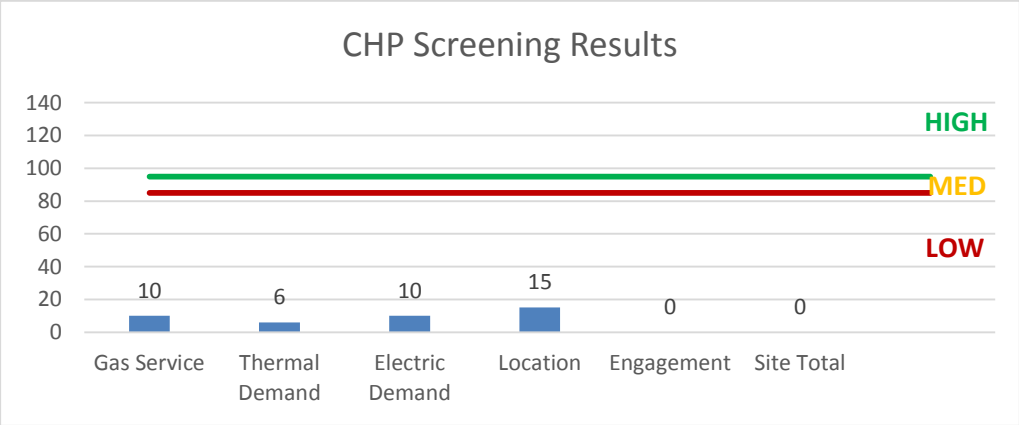
Combined heat and power (CHP) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric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

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

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has a low potential for installing a cost-effective CHP system. Low and infrequent thermal load are the most significant factors contributing to the potential for CHP at the site. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

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

Figure 22 - Combined Heat and Power Screening



7 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.

Figure 23 - ECM Incentive Program Eligibility

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

SmartStart is generally well-suited for implementation of individual measures or small group of measures. It provides flexibility to install measures at your own pace using in-house staff or a preferred contractor.

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.

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.

7.1 SmartStart

Overview

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

Equipment with Prescriptive Incentives Currently Available:

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

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

Incentives

The SmartStart prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SmartsStart 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.

7.2 Pay for Performance - Existing Buildings

Overview

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

Incentives

Incentives are calculated based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

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

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

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

7.3 SREC Registration Program

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

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

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

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

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

7.4 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 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

8.1 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.

8.2 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
Room A-12	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room A-12	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room A-10	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room A-10	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room A-10 (restroom)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$328.50	$10.00	26.28
Room A-9	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$504.00	$75.00	8.85
Room A-9	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Fixtures: Ceiling Mount	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$150.00	$0.00	12.38
Room A-9	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$234.00	$40.00	4.00
Room A-7	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$504.00	$75.00	8.85
Room A-7	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Fixtures: Ceiling Mount	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$150.00	$0.00	12.38
Room A-7	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$234.00	$40.00	4.00
Room A-13	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$504.00	$75.00	8.85
Room A-13	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Fixtures: Ceiling Mount	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$150.00	$0.00	12.38
Room A-13	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$234.00	$40.00	4.00
Room A-14	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room A-14	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room A-15	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.22	820	0.0	$96.95	$738.00	$115.00	6.43
Room A-15 (restroom)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$328.50	$10.00	26.28
Room A-16	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room A-16	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room A-17	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room A-17	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.02	20	0.0	$2.42	$58.50	$10.00	20.02
storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	540	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	540	0.07	70	0.0	$8.22	$190.27	$40.00	18.27
Sprinkler Rm	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.04	41	0.0	$4.85	$117.00	$20.00	20.02

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room A-8	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.37	1,384	0.0	$163.60	$946.80	$170.00	4.75
Room A-8	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$58.50	$10.00	4.00
Room A-8	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
A-Corridor Expo	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$504.00	$75.00	8.85
A-Wing Tech Rm	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$174.50	$10.00	13.57
Restroom (staff)	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.08	308	0.0	$36.35	$445.50	$30.00	11.43
Room A-6	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room A-6	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room A-18	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room A-18	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room A-18 restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$328.50	$10.00	26.28
Room A-4	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room A-4	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room A-5	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room A-2	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.33	1,230	0.0	$145.42	$871.60	$155.00	4.93
Room A-2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room A-2 (restroom)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$328.50	$10.00	26.28
Nurse Room	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.45	1,691	0.0	$199.95	$1,097.20	$200.00	4.49
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$328.50	$10.00	26.28
Room A-3	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.22	820	0.0	$96.95	$738.00	$115.00	6.43
Room A-1	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.22	820	0.0	$96.95	$738.00	$115.00	6.43
Tech Rm	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$233.00	$20.00	8.79
Storage	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.26	246	0.0	$29.07	$702.00	$120.00	20.02
Room B-1	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$504.00	$75.00	8.85
Room B-1	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Fixtures: Ceiling Mount	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$150.00	$0.00	12.38

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room B-3	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$504.00	$75.00	8.85
Room B-3	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Fixtures: Ceiling Mount	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$150.00	$0.00	12.38
Room B-5	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room B-5	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room B-7	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room B-7	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room B-9	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room B-9	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room B-11	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room B-11	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room B-13	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room B-13	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room B-12	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room B-12	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room B-10	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room B-10	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room B-8	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room B-8	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room B-4	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room B-4	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room B-2	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.33	1,230	0.0	$145.42	$871.60	$155.00	4.93
Room B-2 (restroom)	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.04	154	0.0	$18.18	$345.20	$15.00	18.17
Room B-6	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.21	769	0.0	$90.89	$646.00	$110.00	5.90
Room B-6A	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.21	769	0.0	$90.89	$646.00	$110.00	5.90
Room B-14	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	1.23	4,613	0.0	$545.32	$2,526.00	$485.00	3.74

	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
Room B-14	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,496	0.03	104	0.0	$12.26	$96.40	$0.00	7.86
Room B-14 (restroom)	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.04	154	0.0	$18.18	$345.20	$15.00	18.17
Room B-16	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	1.23	4,613	0.0	$545.32	$2,526.00	$485.00	3.74
Room B-16	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,496	0.03	104	0.0	$12.26	$96.40	$0.00	7.86
B-Corridor	16	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	None	No	16	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
B-Corridor	4	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	None	No	4	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
B-Corridor	8	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	None	No	8	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
E-Corridor	10	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,138	None	No	10	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
E-Corridor	8	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	None	No	8	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
E-Corridor	2	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	685	0.0	$80.99	$215.11	$0.00	2.66
E-Corridor	3	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	None	No	3	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
A-Corridor	25	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	None	No	25	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
A-Corridor	2	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	685	0.0	$80.99	$215.11	$0.00	2.66
A-Corridor	12	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,138	None	No	12	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
A-Corridor	8	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	None	No	8	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
F-Corridor	7	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	None	No	7	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
F-Corridor	1	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	343	0.0	$40.49	$107.56	$0.00	2.66
C-Corridor	12	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,138	None	No	12	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C-Corridor	18	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,138	None	No	18	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
C-Corridor	8	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	None	No	8	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
I-Corridor	17	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	None	No	17	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
I-Corridor	6	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	6	LED Exit Signs: 2 W Lamp	None	6	8,760	0.13	2,055	0.0	$242.96	$645.33	$0.00	2.66
I-Corridor	11	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	None	No	11	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
G-Corridor	18	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	None	No	18	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
G-Corridor	3	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.07	1,028	0.0	$121.48	$322.67	$0.00	2.66

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
G-Corridor	12	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	None	No	12	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
B-Corridor	3	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.07	1,028	0.0	$121.48	$322.67	$0.00	2.66
Attic Floor	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$350.00	$60.00	5.98
Attic Floor(C-Wing)	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$350.00	$60.00	5.98
Kitchen Storage	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.21	769	0.0	$90.89	$646.00	$110.00	5.90
Kitchen Storage	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.14	513	0.0	$60.59	$292.50	$50.00	4.00
Kitchen	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.33	1,230	0.0	$145.42	$871.60	$155.00	4.93
Cafeteria	36	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	36	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	1.48	5,535	0.0	$654.39	$2,977.20	$575.00	3.67
Cafeteria	8	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	8	LED - Fixtures: Ceiling Mount	Occupancy Sensor	29	1,496	0.22	820	0.0	$96.95	$1,200.00	$0.00	12.38
Cafeteria	11	Compact Fluorescent: screw in-3lamps/fixt	Wall Switch	26	2,138	Relamp	Yes	11	LED Screw-In Lamps: 5 watt replacemnt	Occupancy Sensor	10	1,496	0.14	514	0.0	$60.74	$330.00	$0.00	5.43
Cafeteria	4	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.09	1,370	0.0	$161.97	$430.22	$0.00	2.66
H-Corridor	3	Compact Fluorescent: screw in-3lamps/fixt	Wall Switch	26	2,138	Relamp	No	3	LED Screw-In Lamps: 5 watt replacemnt	Wall Switch	10	2,138	0.03	118	0.0	$13.95	$90.00	$0.00	6.45
H-Corridor	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,138	0.22	811	0.0	$95.90	$585.00	$100.00	5.06
G-Corridor	10	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	None	No	10	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
G-Corridor	4	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.09	1,370	0.0	$161.97	$430.22	$0.00	2.66
G-Corridor	2	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	None	No	2	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
G-Corridor	4	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	None	No	4	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
G-Corridor	4	LED - Linear Tubes: (4) 3' Lamps	Wall Switch	42	2,138	None	No	4	LED - Linear Tubes: (4) 3' Lamps	Wall Switch	42	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Rm	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,138	0.09	324	0.0	$38.36	$234.00	$40.00	5.06
Media Rm	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.22	820	0.0	$96.95	$738.00	$115.00	6.43
Main Elec	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.09	82	0.0	$9.69	$234.00	$40.00	20.02
Main Gym	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.66	2,460	0.0	$290.84	$1,674.00	$275.00	4.81
Main Gym	4	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.09	1,370	0.0	$161.97	$430.22	$0.00	2.66
Gym Stage	96	Incandescent: 100 Watt Lamp	Wall Switch	100	2,138	Relamp	No	96	LED Screw-In Lamps: 30 Watt LED Flood	Wall Switch	30	2,138	4.40	16,519	0.0	$1,952.87	$1,920.00	$46,080.00	-22.61
storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.09	82	0.0	$9.69	$234.00	$40.00	20.02

	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
Gym Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.12	461	0.0	$54.53	$495.60	$80.00	7.62
storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	540	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	540	0.19	184	0.0	$21.80	$451.20	$90.00	16.57
storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.04	41	0.0	$4.85	$117.00	$20.00	20.02
Attic Floor	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$350.00	$60.00	5.98
Attic Floor A-Wing	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.11	410	0.0	$48.47	$350.00	$60.00	5.98
Room B-15	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	1.23	4,613	0.0	$545.32	$2,526.00	$485.00	3.74
Room B-15	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,496	0.03	104	0.0	$12.26	$96.40	$20.00	6.23
Room B-17	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	1.23	4,613	0.0	$545.32	$2,526.00	$485.00	3.74
Room B-17	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,496	0.03	104	0.0	$12.26	$96.40	$20.00	6.23
Electing Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.13	123	0.0	$14.54	$351.00	$60.00	20.02
Room B-21	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.66	2,460	0.0	$290.84	$1,674.00	$275.00	4.81
Room B-21 (storage)	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,138	0.04	162	0.0	$19.18	$117.00	$20.00	5.06
Boys Restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.14	513	0.0	$60.59	$562.50	$50.00	8.46
Restroom (staff)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$328.50	$10.00	26.28
closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.02	20	0.0	$2.42	$58.50	$10.00	20.02
Girls Restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.14	513	0.0	$60.59	$562.50	$50.00	8.46
Room C-19	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.62	2,306	0.0	$272.66	$1,398.00	$260.00	4.17
Room C-19	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,496	0.04	156	0.0	$18.40	$144.60	$30.00	6.23
Server Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,138	0.01	39	0.0	$4.65	$48.20	$10.00	8.22
Room C-15	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.62	2,306	0.0	$272.66	$1,398.00	$260.00	4.17
Room C-15	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,496	0.04	156	0.0	$18.40	$144.60	$30.00	6.23
Room C-17	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.62	2,306	0.0	$272.66	$1,398.00	$260.00	4.17
Room C-17	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,496	0.04	156	0.0	$18.40	$144.60	$30.00	6.23
Room C-16	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.62	2,306	0.0	$272.66	$1,398.00	$260.00	4.17
Room C-16	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,496	0.04	156	0.0	$18.40	$144.60	$30.00	6.23

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room C-14	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.62	2,306	0.0	$272.66	$1,398.00	$260.00	4.17
Room C-14	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,496	0.04	156	0.0	$18.40	$144.60	$30.00	6.23
Room C-6A	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.12	461	0.0	$54.53	$495.60	$80.00	7.62
Room C-7A	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.12	461	0.0	$54.53	$495.60	$80.00	7.62
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.08	308	0.0	$36.35	$445.50	$30.00	11.43
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.08	308	0.0	$36.35	$445.50	$30.00	11.43
Room C-8	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room C-8	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room C-10	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room C-10	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room C-10	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.04	154	0.0	$18.18	$75.20	$15.00	3.31
Room C-11	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room C-11	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room C-11	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.04	154	0.0	$18.18	$75.20	$15.00	3.31
Room C-9	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room C-9	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room C-9	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.04	154	0.0	$18.18	$75.20	$15.00	3.31
Room C-12	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room C-12	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room C-12	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.04	154	0.0	$18.18	$75.20	$15.00	3.31
Room C-13	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room C-13	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room C-13	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.04	154	0.0	$18.18	$75.20	$15.00	3.31
Room C-5	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room C-5	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room C-5	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.04	154	0.0	$18.18	$75.20	$15.00	3.31
Room C-7	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.16	615	0.0	$72.71	$570.80	$95.00	6.54
Room C-6	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.16	615	0.0	$72.71	$570.80	$95.00	6.54
Room C-4	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Room C-4	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room C-4	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.04	154	0.0	$18.18	$75.20	$15.00	3.31
Room C-3	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.25	923	0.0	$109.06	$721.20	$125.00	5.47
Room C-2	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39
Room C-2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$58.50	$10.00	4.00
Room C-2 (restroom)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$328.50	$10.00	26.28
Room C-1	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.25	923	0.0	$109.06	$721.20	$125.00	5.47
Computer Room	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.53	1,999	0.0	$236.31	$1,247.60	$230.00	4.31
Library	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.62	2,306	0.0	$272.66	$1,398.00	$260.00	4.17
Library	16	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	None	Yes	16	Compact Fluorescent: 2 lamps per fixture - 2 pin	Occupancy Sensor	26	1,496	0.08	307	0.0	$36.27	$0.00	$0.00	0.00
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	540	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	540	0.13	123	0.0	$14.54	$300.80	$60.00	16.57
Library Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.12	461	0.0	$54.53	$495.60	$80.00	7.62
Tech Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.04	41	0.0	$4.85	$117.00	$20.00	20.02
Closet	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	540	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	540	0.16	154	0.0	$18.17	$376.00	$75.00	16.57
Fire Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.02	20	0.0	$2.42	$58.50	$10.00	20.02
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.08	308	0.0	$36.35	$445.50	$30.00	11.43
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.08	308	0.0	$36.35	$445.50	$30.00	11.43
Gym Emerg Exit	3	Exit Signs: Incandescent	None	40	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.07	1,028	0.0	$121.48	$322.67	$0.00	2.66
Gym Emerg Exit	5	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	None	No	5	Compact Fluorescent: 2 lamps per fixture - 2 pin	Wall Switch	26	2,138	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.02	20	0.0	$2.42	$58.50	$10.00	20.02
Music Room	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.49	1,845	0.0	$218.13	$1,172.40	$215.00	4.39

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	540	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	540	0.03	31	0.0	$3.63	$75.20	$15.00	16.57
Closet	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.06	61	0.0	$7.27	$175.50	$30.00	20.02
Custodial Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.02	20	0.0	$2.42	$58.50	$10.00	20.02
Faculty Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$387.00	$20.00	15.14
Faculty Room	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.62	2,306	0.0	$272.66	$1,398.00	$260.00	4.17
Tech Hub	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$174.50	$10.00	13.57
Child Study Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$117.00	$20.00	4.00
Child Study Room	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.37	1,384	0.0	$163.60	$946.80	$170.00	4.75
Conf. Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.25	923	0.0	$109.06	$721.20	$125.00	5.47
Main Office	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,138	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,496	0.74	2,768	0.0	$327.19	$1,623.60	$305.00	4.03
Main Office	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,138	Relamp	Yes	1	LED - Fixtures: Ceiling Mount	Occupancy Sensor	29	1,496	0.03	103	0.0	$12.12	$150.00	$0.00	12.38
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	540	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	540	0.04	41	0.0	$4.85	$117.00	$20.00	20.02
Exterior Front	20	LED Screw-In Lamps: Screw In 9W	Daylight Dimming	9	4,380	None	No	20	LED Screw-In Lamps: Screw In 9W	Daylight Dimming	9	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior Wallpack	1	High-Pressure Sodium: 175 W Lamp	Daylight Dimming	215	4,380	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	53	4,380	0.11	816	0.0	$96.47	$390.68	$100.00	3.01
Exterior Wallpack	5	Metal Halide: (1) 175W Lamp	Daylight Dimming	215	4,380	Fixture Replacement	No	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	53	4,380	0.53	4,080	0.0	$482.35	$1,953.39	$500.00	3.01
Parking Lot	26	Metal Halide: (1) 175W Lamp	Daylight Dimming	215	4,380	Fixture Replacement	No	26	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	Daylight Dimming	53	4,380	2.76	21,216	0.0	$2,508.19	$9,000.81	$1,300.00	3.07
Exterior Wallpack	10	Compact Fluorescent: 2 lamps per fixture - 2 pin	Daylight Dimming	26	4,380	None	No	10	Compact Fluorescent: 2 lamps per fixture - 2 pin	Daylight Dimming	26	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Garage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	2,138	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,496	0.05	205	0.0	$24.24	$387.00	$55.00	13.70

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	School	2	Heating Hot Water Pump	5.0	87.5%	No	2,745	Yes	89.5%	Yes	2	1.35	10,306	0.0	$1,218.39	$8,152.44	$0.00	6.69
Roof Top	B-C Wing, Art Room	1	Exhaust Fan	1.0	82.5%	No	2,745	No	82.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Restrooms	1	Exhaust Fan	1.0	82.5%	No	2,745	No	82.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Kitchen Restroom	1	Exhaust Fan	1.0	82.5%	No	2,745	No	82.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Kitchen (hood)	1	Exhaust Fan	1.0	82.5%	No	2,745	No	82.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Attic Floor	Attic Circ. Fan	4	Ventilation Fan	0.5	60.0%	No	2,745	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Attic Floor	Attic Circ. Fan	1	Ventilation Fan	0.5	60.0%	No	2,745	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Attic Floor	Attic Circ. Fan	2	Ventilation Fan	0.3	60.0%	No	2,745	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gym	AHU1	1	Supply Fan	5.0	87.5%	No	2,745	Yes	89.5%	Yes	1	0.72	2,236	0.0	$264.31	$4,076.22	$400.00	13.91
Gym	AHU2	1	Supply Fan	5.0	87.5%	No	2,745	Yes	89.5%	Yes	1	0.72	2,236	0.0	$264.31	$4,076.22	$400.00	13.91
Classrooms	Fans for Split-System Air-Source HP	38	Supply Fan	2.0	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classrooms	Fans for Split-System Air-Source HP	38	Exhaust Fan	1.0	82.5%	No	2,745	No	82.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classrooms	Unit Ventilators (UV-1 to 6)	6	Ventilation Fan	0.3	60.0%	No	2,745	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classrooms	Unit Ventilators (Classrooms C2,C3,C4,C5,C8,C9)	6	Ventilation Fan	0.3	60.0%	No	2,745	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
RTU-1	RTU1(Classrooms B15,B17,B19,ART,C19,C17,C15,C14,C16,B16,B14,B-WING RESTROOMS, BWING CORR,C-WING CORR.)	1	Supply Fan	5.0	87.5%	No	2,745	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
RTU-2	RTU-2(Cafeteria)	1	Supply Fan	5.0	87.5%	No	2,745	No	87.5%	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
Server Room	Server Room	1	Split-System AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	Library	1	Split-System AC	7.50		Yes	1	Split-System AC	7.50		11.50		No	0.79	1,328	0.0	$156.96	$8,728.28	$547.50	52.12
Ground Floor	Main Office	1	Split-System AC	5.00		Yes	1	Split-System AC	5.00		14.00		No	1.15	1,939	0.0	$229.22	$7,481.10	$460.00	30.63
Ground Floor	Guidance Office	1	Split-System AC	5.00		Yes	1	Split-System AC	5.00		14.00		No	1.15	1,939	0.0	$229.22	$7,481.10	$460.00	30.63
Ground Floor	Computer Room	1	Split-System AC	4.00		Yes	1	Split-System AC	4.00		14.00		No	0.92	1,551	0.0	$183.37	$5,984.88	$368.00	30.63
Ground Floor	Gym	1	Split-System AC	15.00		Yes	1	Split-System AC	15.00		11.50		No	1.57	2,655	0.0	$313.93	$17,397.73	$1,185.00	51.64
Ground Floor	Rm C7A	1	Split-System AC	2.00		Yes	1	Split-System AC	2.00		14.00		No	0.46	776	0.0	$91.69	$2,992.44	$184.00	30.63
Ground Floor	Rm C5	1	Split-System AC	2.00		Yes	1	Split-System AC	2.00		14.00		No	0.46	776	0.0	$91.69	$2,992.44	$184.00	30.63
Classrooms	Classrooms	38	Split-System Air-Source HP	4.00	46.00	Yes	38	Split-System Air-Source HP	4.00	46.00	14.00	3.80	No	30.78	61,545	0.0	$7,276.06	$257,015.28	$13,984.00	33.40
Roof Top	RTU1(Classrooms B15,B17,B19,ART,C19,C17,C15,C14,C16,B16,B14,B-WING RESTROOMS, BWING CORR,C-WING CORR.)	1	Packaged AC	30.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	B & C Wing	1	Packaged AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Server Room	1	Split-System Air-Source HP	2.00	1.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU-2(Cafeteria)	1	Packaged AC	30.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Rm	Gym-AHU1	1	Split-System AC	15.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Rm	Gym-AHU2 (cooling only)	1	Split-System AC	15.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Attic Floor	Guidance Office	1	Split-System Air-Source HP	2.00	23.20	Yes	1	Split-System Air-Source HP	2.00	23.20	14.00	3.80	No	0.25	1,257	0.0	$148.55	$3,381.78	$184.00	21.53
Attic Floor	Main Office	1	Split-System Air-Source HP	2.00	23.20	Yes	1	Split-System Air-Source HP	2.00	23.20	14.00	3.80	No	0.25	1,257	0.0	$148.55	$3,381.78	$184.00	21.53
Attic Floor	Library	1	Split-System Air-Source HP	7.50	87.00	Yes	1	Split-System Air-Source HP	7.50	87.00	11.50	3.60	No	0.00	2,833	0.0	$334.94	$10,898.85	$547.50	30.90
Attic Floor	Computer Rm	1	Split-System Air-Source HP	5.00	23.20	Yes	1	Split-System Air-Source HP	5.00	23.20	14.00	3.80	No	0.62	1,889	0.0	$223.29	$8,454.45	$460.00	35.80
Attic Floor	A Wing - Custodian Office	1	Electric Resistance Heat		34.13	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Attic Floor	C & A Corridor	1	Electric Resistance Heat		93.52	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Attic Floor	C & A Corridor	1	Electric Resistance Heat		93.52	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classrooms	UV-1 to 6 (Univent)	6	Electric Resistance Heat		10.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Corridors	CH-1 to 5 (Cabinet Heater)	5	Electric Resistance Heat		10.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Boiler Room	2	Condensing Hot Water Boiler	800.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

DHW Inventory & Recommendations

		Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	School B-C Wing	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Rest of building	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Storage	Kitchen	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Reach-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 Energy Efficient Doors?	Install Door Heater Control?	Install Aluminum Night Covers?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Cooler (35F to 55F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Cooler (35F to 55F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Medium Temp Freezer (0F to 30F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Medium Temp Freezer (0F to 30F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Low Temp Freezer (-35F to -5F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	2	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Gas Combination Oven/Steam Cooker (15 - 28 Pans)	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	Insulated Food Holding Cabinet (1/2 Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Insulated Food Holding Cabinet (1/2 Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	2	Insulated Food Holding Cabinet (1/2 Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Dishwasher Inventory & Recommendations

	Existing Conditions					Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Dishwasher Type	Water Heater Fuel Type	Booster Heater Fuel 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	Payback w/ Incentives in Years
Kitchen	1	Door Type (Low Temp)	Natural Gas	None	No	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?
Art/Ceramics Room	1	Electric Kiln	11,520.0	No
School	174	Desktop Computers	110.0	Yes
School	12	Printer	460.0	Yes
School	4	Coffee Machine	950.0	Yes
School	107	small printer	150.0	Yes
School	3	Desktop Computers-Non LCD	144.0	Yes
School	7	Water Fountain	265.0	Yes
School	7	Refrigerator	265.0	Yes
School	5	Microwave	1,000.0	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
Faculty Room	1	Refrigerated	Yes	0.00	1,612	0.0	$190.56	$230.00	$0.00	1.21
Faculty Room	1	Non-Refrigerated	Yes	0.00	343	0.0	$40.49	$230.00	$0.00	5.68

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Whiton Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 90,321
Built: 1997

For Year Ending: November 30, 2016
Date Generated: May 26, 2017

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Whiton Elementary School 470 Whiton Rd. Neshanic Station, New Jersey 08853	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 5894946

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
72.1 kBtu/ft²

Source EUI
169.6 kBtu/ft²

Annual Energy by Fuel	
Electric - Solar (kBtu)	333,690 (5%)
Electric - Grid (kBtu)	4,062,736 (62%)
Natural Gas (kBtu)	2,119,272 (32%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	82.4
National Median Source EUI (kBtu/ft²)	193.7
% Diff from National Median Source EUI	-12%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	578

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)