Local Government Energy Audit:
Energy Audit Report

Upper Pittsgrove Elementary School

Upper Pittsgrove Board of Education

235 Pine Tavern Road

Monroeville, NJ 08343

March 23, 2018

Final Report by:

TRC Energy Services

Disclaimer

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

The energy conservation measures and estimates of energy savings have been reviewed for technical accuracy. However, estimates of final energy savings are not guaranteed, because final savings may depend on behavioral factors and other uncontrollable variables. TRC Energy Services (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 Upper Pittsgrove 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

Upper Pittsgrove Elementary School is a one-story building totaling 77,870 square feet and was constructed in 1962. The building has flat and pitch roofs and exterior walls are finished with brick veneer. Interior lighting consists mainly of T8 linear fluorescent fixtures which are mostly controlled with manual wall switches. Cooling and heating systems consist of geothermal heat pumps, eight energy recovery and one packaged rooftop 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 seven (7) measures of which six (6) measures are recommended based on having a simple payback from energy savings less than two-thirds (2/3) of the proposed equipment's useful life. Together the recommended measures represent an opportunity to reduce annual energy costs by $15,495 and annual greenhouse gas emissions by 112,132 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 4.1 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 Upper Pittsgrove Elementary School's annual energy use by 18%.

Figure 1 – Previous 12 Month Utility Costs

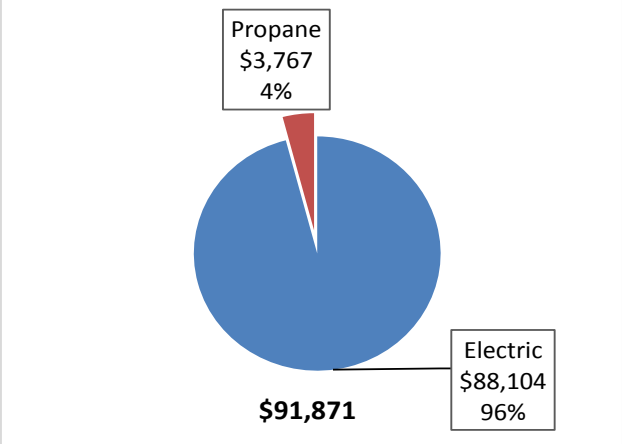
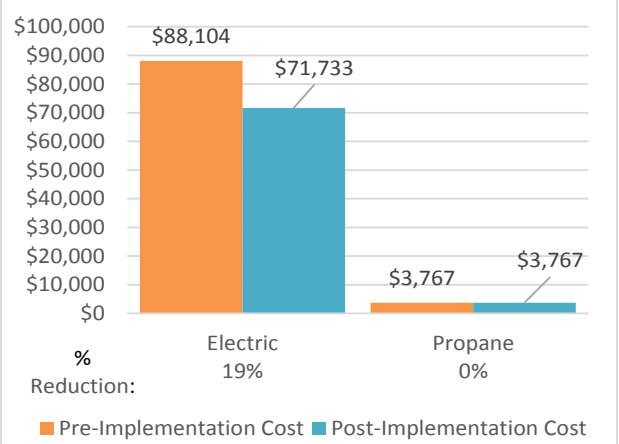


Figure 2 – Potential Post-Implementation Costs



A detailed description of Upper Pittsgrove 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 Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**80,504**	**26.2**	**$11,202.27**	**$65,593.83**	**$11,760.00**	**$53,833.83**	**4.8**	**81,067**
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	1,544	0.5	$214.79	$1,521.00	$130.00	$1,391.00	6.5	1,554
ECM 2	Retrofit Fixtures with LED Lamps	Yes	78,960	25.7	$10,987.47	$64,072.83	$11,630.00	$52,442.83	4.8	79,512
Lighting Control Measures			**20,113**	**6.6**	**$2,798.83**	**$9,048.00**	**$1,120.00**	**$7,928.00**	**2.8**	**20,254**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	20,113	6.6	$2,798.83	$9,048.00	$1,120.00	$7,928.00	2.8	20,254
Electric Unitary HVAC Measures			**6,294**	**3.7**	**$875.86**	**$17,821.06**	**$730.00**	**$17,091.06**	**19.5**	**6,338**
	Install High Efficiency Electric AC	No	6,294	3.7	$875.86	$17,821.06	$730.00	$17,091.06	19.5	6,338
HVAC System Improvements			**2,885**	**0.7**	**$401.48**	**$750.00**	**$250.00**	**$500.00**	**1.2**	**2,905**
ECM 4	Install Dual Enthalpy Outside Economizer Control	Yes	2,885	0.7	$401.48	$750.00	$250.00	$500.00	1.2	2,905
Domestic Water Heating Upgrade			**5,896**	**0.0**	**$820.46**	**$121.89**	**$0.00**	**$121.89**	**0.1**	**5,937**
ECM 5	Install Low-Flow Domestic Hot Water Devices	Yes	5,896	0.0	$820.46	$121.89	$0.00	$121.89	0.1	5,937
Plug Load Equipment Control - Vending Machine			**1,954**	**0.0**	**$271.95**	**$460.00**	**$0.00**	**$460.00**	**1.7**	**1,968**
ECM 6	Vending Machine Control	Yes	1,954	0.0	$271.95	$460.00	$0.00	$460.00	1.7	1,968
TOTALS FOR RECOMENDED MEASURES			**111,353**	**33.4**	**$15,495.15**	**$75,973.72**	**$13,130.00**	**$62,843.72**	**4.1**	**112,132**
TOTALS FOR ALL MEASURES			**117,647**	**37.1**	**$16,370.85**	**$93,794.78**	**$13,860.00**	**$79,934.78**	**4.9**	**118,470**

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

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

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

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

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 conditioning 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.

HVAC System Improvements generally involve the installation of automated controls to reduce heating and cooling demand during periods of reduced demand. These measures could encompass changing temperature setpoints, using outside air for free cooling, or limiting excessive outside air during extreme outdoor air temperature conditions. These measures save energy by reducing the demand on HVAC systems and the amount of time systems operate.

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

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 13 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 Upper Pittsgrove Elementary School include:

- Reduce Air Leakage
- Close Doors and Windows
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Turn Off Unneeded Motors
- Perform Routine Motor Maintenance
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Check for and Seal Duct Leakage
- Perform Proper Water Heater Maintenance
- Water Conservation

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

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation for Upper Pittsgrove Elementary School. A small portion of the flat roof has 140 photovoltaic (PV) arrays installed which have a total capacity of 28.8 kW. Based on the configuration of the site and its loads there is a high potential for installing an additional photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	High	
System Potential	161	kW DC STC
Electric Generation	191,811	kWh/yr
Displaced Cost	$16,690	/yr
Installed Cost	$418,600	

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

1.3 Implementation Planning

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

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

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

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

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

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

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.4 for additional information on the ESIP Program.

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

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Lisa M. DiNovi	Business Administrator	ldinovi@myronlpowell.org	8563588163 Ext. 1017
Designated Representative			
John Robinson	Head Custodian	jrobinson@upsmailbox.net	(856) 362-3582
TRC Energy Services			
Moussa Traore	Auditor	mtraore@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On May 24, 2017, TRC performed an energy audit at Upper Pittsgrove Elementary School located in Monroeville, New Jersey. TRC's auditor met with John Robinson, Head Custodian to review the facility operations and help focus our investigation on specific energy-using systems.

The 77,870 square foot building is a one-story facility and is comprised of classrooms, administrative offices, auditorium, cafeteria, kitchen, gymnasium, storage rooms and mechanical spaces. The building also houses the Upper Pittsgrove Board of Education offices. It was built in 1962 and has student enrollment from Pre-K to 8th grade. The facility has no gas service. Propane is delivered throughout the school year to fuel the kitchen ovens.

2.3 Building Occupancy

The school operates on a ten (10) month schedule and is open Monday through Friday. The typical schedule is presented in the table below. During a typical day, the school is occupied by approximately 360 students and 52 staff.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Upper Pittsgrove Elementary School	Weekday	8:00 AM - 4:00 PM
Upper Pittsgrove Elementary School	Weekend	Closed

2.4 Building Envelope

The one-story building has a concrete foundation, a flat, built up black rubber roof and a pitch roof covered with asphalt shingles. The roofs are in acceptable condition. Exterior walls for the building are constructed of brick veneer.

The windows throughout the facility are in good condition. Typical windows are double pane, clear glass with aluminum frames. Exterior doors are constructed of metal. Some door seals were found to be worn out. This increases the level of outside air-infiltration. We recommend to perform weatherization services such as caulking on these doors. This will result in minimal energy savings, but should be part of the school's operation and maintenance plan.

2.5 On-Site Generation

Upper Pittsgrove Elementary School has a 28.8 kW photovoltaic (PV) array installed on a small portion of the flat roof. The solar production represents 5% of the building's annual electricity need.

2.6 Energy-Using Systems

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

Lighting System

Interior lighting is provided mainly by 32-Watt T8 linear fluorescent lamps with electronic ballasts as well as some linear LED tubes. Most of the fixtures are two (2) or three (3)-lamps, four (4)-foot long troffers. Corridors (except the gymnasium corridor) have been retrofitted with linear LED tubes. The conference room and restrooms lights have also been retrofitted to linear LED tubes. The library, Board offices and the child study room are lit with a combination of 32-Watt linear fluorescent T8 lamps and LED tubes. The auditorium stage lights have been also retrofitted to LED fixtures. There are one (1) boys and one (1) girls restrooms that are lit with 40-Watt fluorescent T12 fixtures. Interior lighting control is provided by manual wall switches except Mrs. Helmsley's classroom that is controlled with occupancy sensor.

Exterior lighting system has been retrofitted to LED fixtures which consist of recessed downlight and downlight wall mounted area fixtures and the parking lot pole mounted fixtures. They are controlled with photocells.

Cooling and Heating Systems

The building is served by a geothermal heat pump loop system. The geothermal system provides both heating and cooling to the entire facility. There are 64 wells with a depth of 468 feet each. The 64 wells consist of eight (8) circuits with eight (8) wells per circuit and have a maximum entering water temperature of 90°F and a minimum entering water temperature of 40°F.

Two (2) condenser water pumps located in the maintenance shop with 30 hp motors each fitted with variable speed drives circulate condenser water throughout the facility. Thirteen vertical 4-ton Airedale Schoolmates heat pumps are used to condition part of the classrooms. They consist of water source heat pumps, desiccant heat recovery wheels and no electric heat.

The gymnasium, all purpose room and cafeteria are heated and cooled by three, 3-ton Mammoth horizontal water source heat pumps located in the space above the ceilings. We could not get enough information to determine the capacity of the remaining water source heat pumps. The head of maintenance of the facility mentioned that they are slightly over one ton.

The facility also has one (1) Mammoth rooftop packaged unit that is estimated to be 10-ton in capacity. The unit is 13 years old.

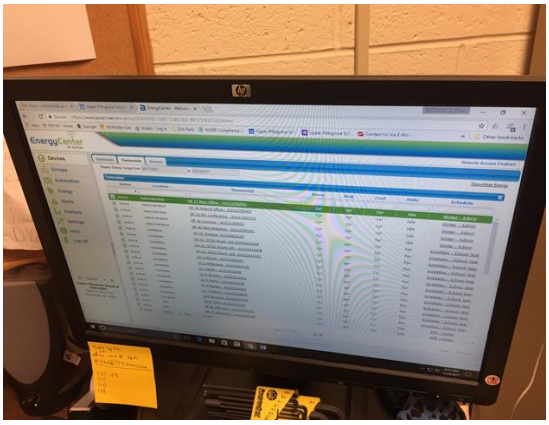
Most of the geothermal units except the units serving the lunch room, break room and copy room are connected and controlled by the building's DDC System and individual thermostats located in spaces.

Ventilation System

The ventilation system consists of eight (8) York unitized energy recovery ventilators (UERV) located on the flat roof. Each unit is equipped with one intake air and one exhaust air blower motor. The units are rated from 1,200 to 46,000 cubic feet per minute (CFM) based on the capacity of the intake air and exhaust air blower motors. The internal wheel in each unit provides sensible and latent energy exchange between the entering and exhaust air of the building. This allows a substantial amount of the energy, which is normally lost in the exhaust air stream to be returned into the entering air. The units are three (3) years old and appear in good condition.

Air is also exhausted in the science lab and the locker rooms through the roof mounted exhaust air fans

Building Energy Management System (BEMS)



Most of the geothermal units except the units serving the lunch room, break room and copy room are connected and controlled by the building energy management system.

Domestic Hot Water Heating System

Domestic hot water for the school consists of two (2) electric water heaters. One (1) A.O. Smith with an input rating of 6 kW and 80 gallon storage tank, and one (1) Bradford White with an input rating of 18 kW and 119 gallon storage tank. The water heaters are 23 and 12 years old respectively.

Food Service & Refrigeration

The school also houses a small non-commercial kitchen. The kitchen includes propane cooking ovens, insulated food holding cabinet, one (1) standup refrigerator, four (4) refrigerator chests, one (1) walk-in low temperature freezer and one (1) walk-in cooler. The kitchen is well maintained.

Building Plug Load

There are approximately 250 computer work stations throughout the facility and they are mostly desktop units with LCD monitors. There is no centralized PC power management software installed.

There is one (1) server closest in the facility that has cooling and heating provided by one (1) water source heat pump. There are two (2) vending machines located in the copy room.

2.7 Water-Using Systems

There are several restrooms at this facility. A sampling of restrooms found that the faucets are rated for 2.2 gallons per minute (gpm), the toilets are rated at 2.5 gallons per flush (gpf) and the urinals are rated at 2 gpf. There is no restroom with showers.

3 SITE ENERGY USE AND COSTS

Utility data for electricity and propane was analyzed to identify opportunities for savings. In addition, data for electricity and propane 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

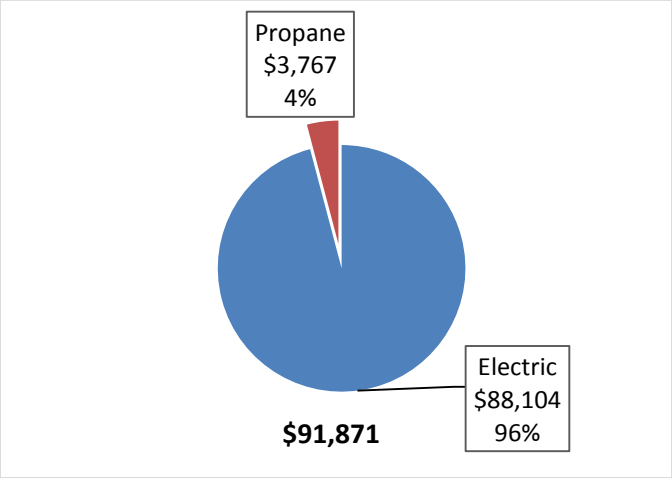
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Upper Pittsgrove Elementary School		
Fuel	**Usage**	**Cost**
Electricity	633,150 kWh	$88,104
Propane	979 Gallons	$3,767
Total		**$91,871**

The current annual energy cost for this facility is $91,871 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by Atlantic City Electric. The average electric cost over the past 12 months was $0.139/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 9 - Electric Usage & Demand

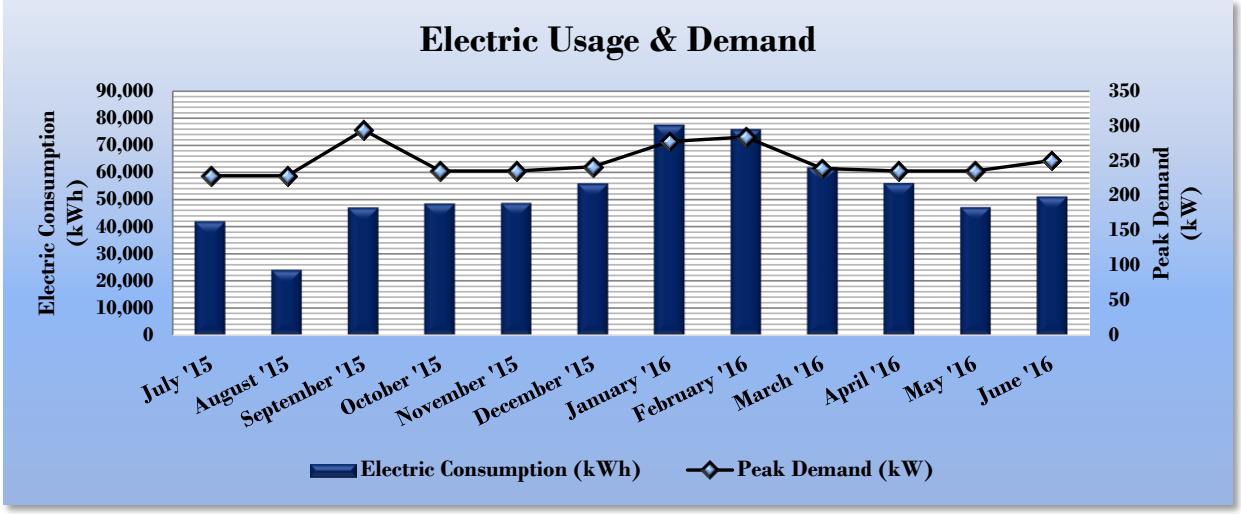


Figure 10 - Electric Usage & Demand

Electric Billing Data for Upper Pittsgrove Elementary School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
7/22/15	31	41,813	228	$1,925	$7,305
8/20/15	31	23,956	228	$1,692	$2,914
9/22/15	31	46,854	294	$2,481	$5,383
10/21/15	31	48,312	236	$1,744	$7,365
11/19/15	30	48,563	236	$1,744	$7,255
12/18/15	30	55,644	242	$1,789	$7,778
1/21/16	31	77,249	278	$2,410	$10,381
2/18/16	29	75,507	284	$2,030	$9,755
3/18/16	30	61,625	239	$1,771	$7,940
4/20/16	30	55,730	236	$1,984	$7,741
5/19/16	30	47,024	236	$1,744	$6,824
6/21/16	31	50,873	250	$2,110	$7,465
Totals	**365**	**633,150**	**294.4**	**$23,424**	**$88,104**
Annual	**365**	**633,150**	**294.4**	**$23,424**	**$88,104**

3.3 Propane Usage

Propane is provided by Suburban. The average propane cost for the past 12 months is $3.848/Gallon, which is the blended rate used throughout the analyses in this report. The propane consumption is shown in the table below.

Figure 11 – Propane Usage

Propane Billing Data for Upper Pittsgrove Elementary School				
Period Ending	Days in Period	Propane Usage (Gallons)	Fuel Cost	TRC Estimated Usage?
11/1/15	30	254	$962	No
12/1/15	31	71	$277	No
1/1/16	31	247	$962	No
2/1/16	28	83	$321	No
3/1/16	31	90	$362	No
4/1/16	30	18	$68	No
5/1/16	31	175	$660	No
6/1/16	30	0	$0	No
7/1/16	31	0	$0	No
8/1/16	31	0	$0	No
9/1/16	30	21	$80	Yes
10/1/16	31	19	$74	Yes
Totals	**365**	**979**	**$3,767**	2
Annual	**365**	**979**	**$3,767**	

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 12 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Upper Pittsgrove Elementary School	National Median Building Type: Higher Education - Public
Source Energy Use Intensity (kBtu/ft^2)	88.3	262.6
Site Energy Use Intensity (kBtu/ft^2)	28.9	130.7

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

Figure 13 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Upper Pittsgrove Elementary School	National Median Building Type: Higher Education - Public
Source Energy Use Intensity (kBtu/ft^2)	73.0	262.6
Site Energy Use Intensity (kBtu/ft^2)	24.0	130.7

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 84.

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

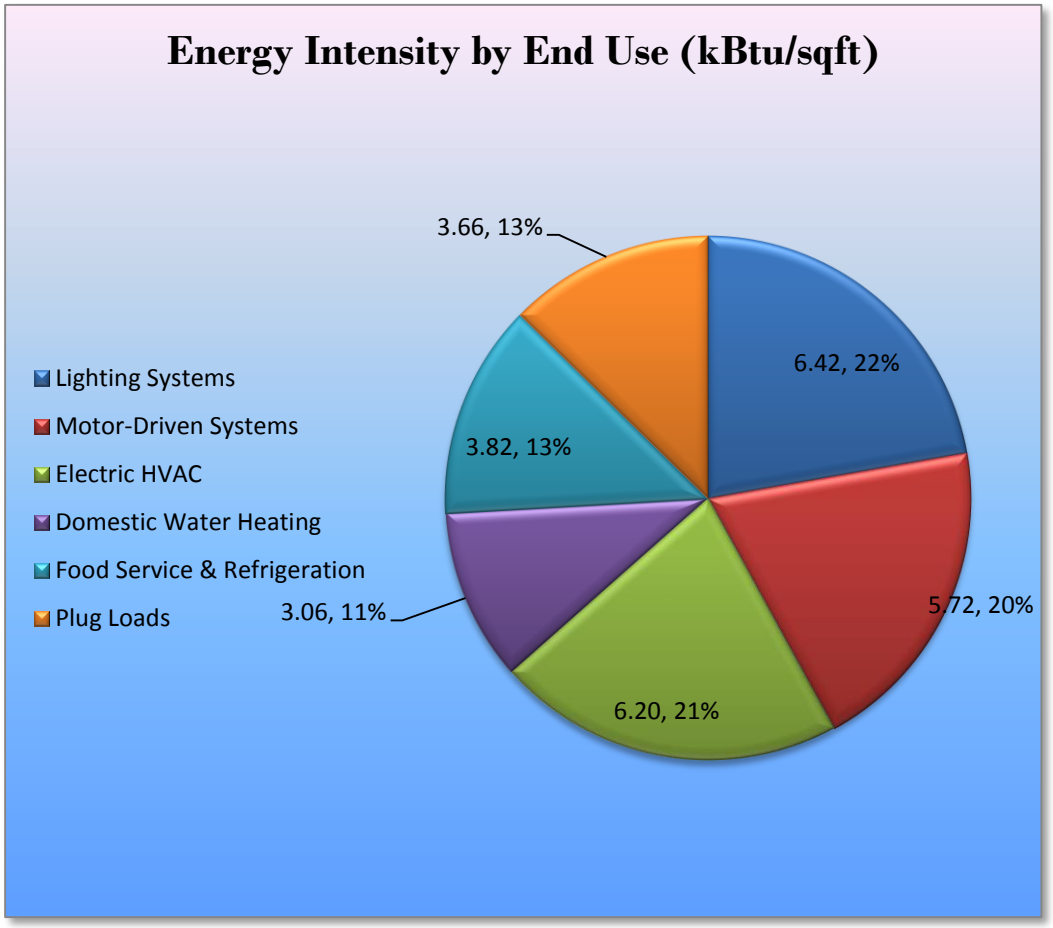
For more information on ENERG STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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 14 - Energy Balance (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 Upper Pittsgrove Elementary School regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016 approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances. A higher level of investigation may be necessary to support any custom SmartStart or P4P, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 8.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 15 – 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		**80,504**	**26.2**	**0.0**	**$11,202.27**	**$65,593.83**	**$11,760.00**	**$53,833.83**	**4.8**	**81,067**
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	1,544	0.5	0.0	$214.79	$1,521.00	$130.00	$1,391.00	6.5	1,554
ECM 2	Retrofit Fixtures with LED Lamps	78,960	25.7	0.0	$10,987.47	$64,072.83	$11,630.00	$52,442.83	4.8	79,512
Lighting Control Measures		**20,113**	**6.6**	**0.0**	**$2,798.83**	**$9,048.00**	**$1,120.00**	**$7,928.00**	**2.8**	**20,254**
ECM 3	Install Occupancy Sensor Lighting Controls	20,113	6.6	0.0	$2,798.83	$9,048.00	$1,120.00	$7,928.00	2.8	20,254
HVAC System Improvements		**2,885**	**0.7**	**0.0**	**$401.48**	**$750.00**	**$250.00**	**$500.00**	**1.2**	**2,905**
ECM 4	Install Dual Enthalpy Outside Economizer Control	2,885	0.7	0.0	$401.48	$750.00	$250.00	$500.00	1.2	2,905
Domestic Water Heating Upgrade		**5,896**	**0.0**	**0.0**	**$820.46**	**$121.89**	**$0.00**	**$121.89**	**0.1**	**5,937**
ECM 5	Install Low-Flow Domestic Hot Water Devices	5,896	0.0	0.0	$820.46	$121.89	$0.00	$121.89	0.1	5,937
Plug Load Equipment Control - Vending Machine		**1,954**	**0.0**	**0.0**	**$271.95**	**$460.00**	**$0.00**	**$460.00**	**1.7**	**1,968**
ECM 6	Vending Machine Control	1,954	0.0	0.0	$271.95	$460.00	$0.00	$460.00	1.7	1,968
TOTALS		**111,353**	**33.4**	**0.0**	**$15,494.99**	**$75,973.72**	**$13,130.00**	**$62,843.72**	**4.1**	**112,132**

* - 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 16 below.

Figure 16 – 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		**80,504**	**26.2**	**0.0**	**$11,202.27**	**$65,593.83**	**$11,760.00**	**$53,833.83**	**4.8**	**81,067**
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	1,544	0.5	0.0	$214.79	$1,521.00	$130.00	$1,391.00	6.5	1,554
ECM 2	Retrofit Fixtures with LED Lamps	78,960	25.7	0.0	$10,987.47	$64,072.83	$11,630.00	$52,442.83	4.8	79,512

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: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	1,544	0.5	0.0	$214.79	$1,521.00	$130.00	$1,391.00	6.5	1,554
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

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	78,960	25.7	0.0	$10,987.47	$64,072.83	$11,630.00	$52,442.83	4.8	79,512
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

4.1.2 Lighting Control Measures

Figure 17 – 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		**20,113**	**6.6**	**0.0**	**$2,798.83**	**$9,048.00**	**$1,120.00**	**$7,928.00**	**2.8**	**20,254**
ECM 3	Install Occupancy Sensor Lighting Controls	20,113	6.6	0.0	$2,798.83	$9,048.00	$1,120.00	$7,928.00	2.8	20,254

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

ECM 3: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
20,113	6.6	0.0	$2,798.83	$9,048.00	$1,120.00	$7,928.00	2.8	20,254

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in all classrooms, offices, library and conference room. 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 HVAC System Upgrades

Our recommendation for HVAC system improvement are summarized in Figure 18 below.

Figure 18 - Summary of HVAC System Improvement 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)
HVAC System Improvements		**2,885**	**0.7**	**0.0**	**$401.48**	**$750.00**	**$250.00**	**$500.00**	**1.2**	**2,905**
ECM 4	Install Dual Enthalpy Outside Economizer Control	2,885	0.7	0.0	$401.48	$750.00	$250.00	$500.00	1.2	2,905

ECM 4: Install Dual-Enthalpy Outside Economizer 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)
2,885	0.7	0.0	$401.48	$750.00	$250.00	$500.00	1.2	2,905

Measure Description

Dual enthalpy economizers are used to control a ventilation system's outside air intake in order to reduce a facility's total cooling load. A dual-enthalpy economizer monitors the air temperature and humidity of both the outside and return air. The control supplies the lowest energy (temperature and humidity) air to the air handling system. When outside air conditions allow, outside air can be used for cooling instead of running the air handling system's compressor. This reduces the demand on the cooling system, lowering its usage hours and saving energy.

Savings result from using outside air instead of mechanical cooling when outside air conditions permit.

4.1.4 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 19 below.

Figure 19 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**5,896**	**0.0**	**0.0**	**$820.46**	**$121.89**	**$0.00**	**$121.89**	**0.1**	**5,937**
ECM 5	Install Low-Flow Domestic Hot Water Devices	5,896	0.0	0.0	$820.46	$121.89	$0.00	$121.89	0.1	5,937

ECM 5: Install Low-Flow DHW Devices

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
5,896	0.0	0.0	$820.46	$121.89	$0.00	$121.89	0.1	5,937

Measure Description

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

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

4.1.5 Plug Load Equipment Control - Vending Machines

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine			**1,954**	**0.0**	**$271.95**	**$460.00**	**$0.00**	**$460.00**	**1.7**	**1,968**
ECM 6	Vending Machine Control	Yes	1,954	0.0	$271.95	$460.00	$0.00	$460.00	1.7	1,968

ECM 6: 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	$271.95	$460.00	$0.00	$460.00	1.7	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	**6,294**	**3.7**	**0.0**	**$875.86**	**$17,821.06**	**$730.00**	**$17,091.06**	**19.5**	**6,338**
Install High Efficiency Electric AC	6,294	3.7	0.0	$875.86	$17,821.06	$730.00	$17,091.06	19.5	6,338
TOTALS	**6,294**	**3.7**	**0.0**	**$875.86**	**$17,821.06**	**$730.00**	**$17,091.06**	**19.5**	**6,338**

* - 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)
6,294	3.7	0.0	$875.86	$17,821.06	$730.00	$17,091.06	19.5	6,338

Measure Description

We evaluated replacing the standard efficiency Mammoth rooftop packaged air conditioning unit with high efficiency packaged air conditioning unit. 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

The simple payback for this measure is nearly 20 years which is more than the typical useful life of 15 years for package unit. Therefore, this measure is not recommended.

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.

Reduce Air Leakage

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

Close Doors and Windows

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

Perform Proper Lighting Maintenance

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

Develop a Lighting Maintenance Schedule

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

Ensure Lighting Controls Are Operating Properly

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

Turn Off Unneeded Motors

Electric motors often run unnecessarily, and this is an overlooked opportunity to save energy. These motors should be identified and turned off when appropriate. For example, exhaust fans often run unnecessarily when ventilation requirements are already met. Reducing run hours for these motors can result in significant energy savings. Whenever possible, use automatic devices such as twist timers or occupancy sensors to ensure that motors are turned off when not needed.

Perform Routine Motor Maintenance

Motors consist of many moving parts whose collective degradation can contribute to a significant loss of motor efficiency. In order to prevent damage to motor components, routine maintenance should be performed. This maintenance consists of cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

Practice Proper Use of Thermostat Schedules and Temperature Resets

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

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 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 (3) to four (4) years old have a technician inspect the sacrificial anode annually.

Water Conservation

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

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

Refer to Section 4.1.4 for any low-flow ECM recommendations.

6 On-Site Generation Measures

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

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

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

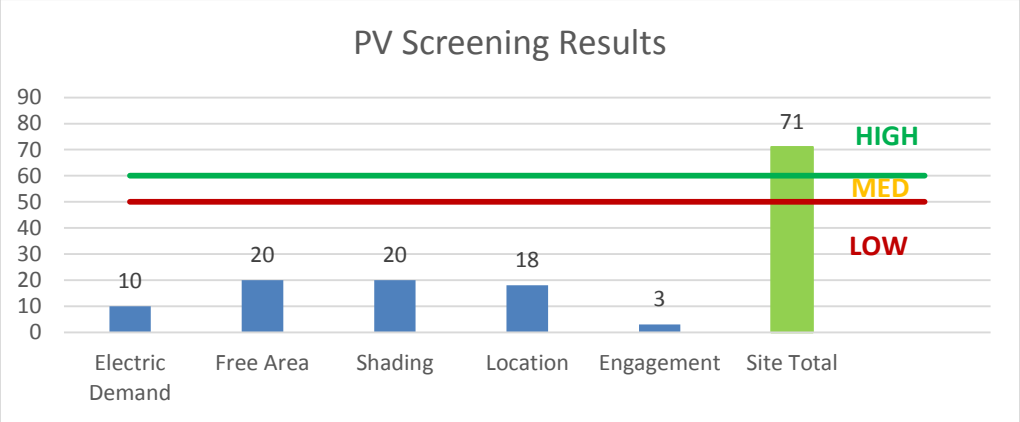
6.1 Photovoltaic

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

In addition to the existing 140 PV arrays installed on the roof which produce 28.8 kW, there is a high potential for installing an additional photovoltaic (PV) array.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the high potential for an additional PV on the roof. If Upper Pittsgrove Elementary School is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 21 - Photovoltaic Screening



Potential	High	
System Potential	161	kW DC STC
Electric Generation	191,811	kWh/yr
Displaced Cost	$16,690	/yr
Installed Cost	$418,600	

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

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

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

6.2 Combined Heat and Power

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

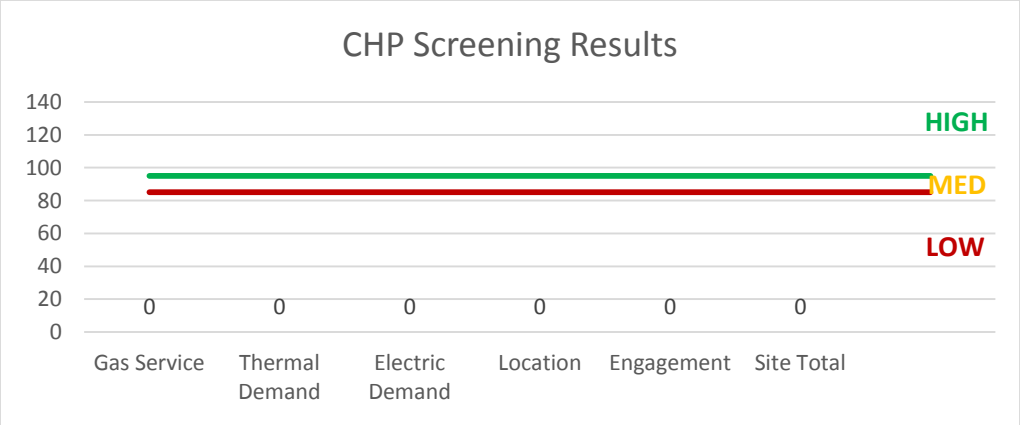
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

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

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

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

Figure 22 - Combined Heat and Power Screening



7 DEMAND RESPONSE

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

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

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

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

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

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

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

8 PROJECT FUNDING / INCENTIVES

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

Figure 23 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x			x		
ECM 2	Retrofit Fixtures with LED Lamps	x			x		
ECM 3	Install Occupancy Sensor Lighting Controls	x			x		
ECM 4	Install Dual Enthalpy Outside Economizer Control				x		
ECM 5	Install Low-Flow Domestic Hot Water Devices	X			x		
ECM 6	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. Direct Install caters to small to mid-size facilities that can bundle multiple ECMs together. This can greatly simplify participation and may lead to higher incentive amounts, but requires the use of pre-approved contractors. The P4P program is a "whole-building" energy improvement program designed for larger facilities. It requires implementation of multiple measures meeting minimum savings thresholds, as well as use of pre-approved consultants. The Large Energy Users Program (LEUP) is available to New Jersey's largest energy users giving them flexibility to install as little or as many measures, in a single facility or several facilities, with incentives capped based on the entity's annual energy consumption. LEUP applicants can use in-house staff or a preferred contractor.

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

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

8.1 SmartStart

Overview

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 SmartStart program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentive offerings for specific devices.

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

How to Participate

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

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

8.2 Pay for Performance - Existing Buildings

Overview

The Pay for Performance – Existing Buildings (P4P EB) program is designed for larger customers with a peak demand over 200 kW in any of the preceding 12 months. Under this program the minimum installed scope of work must include at least two (2) 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 (1) 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 (1) year after the installation. At each of these three (3) milestones your Partner will also facilitate securing program incentives.

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

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

8.3 SREC Registration Program

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

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

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

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

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

8.4 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.

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Maintenance Shop	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.22	671	0.0	$93.42	$584.00	$100.00	5.18
Maintenance Shop	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.03	100	0.0	$13.86	$75.20	$15.00	4.34
Maintenance Shop	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	None	No	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Corridor - Gymn	22	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	Yes	22	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,225	0.11	339	0.0	$47.13	$232.00	$0.00	4.92
Corridor - Gymn	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Corridor - Lower Wing	26	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	Yes	26	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,225	0.13	400	0.0	$55.70	$232.00	$0.00	4.17
Corridor - Lower Wing	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Corridor - Nurse Room	7	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	Yes	7	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,225	0.04	108	0.0	$15.00	$116.00	$0.00	7.74
Corridor - Nurse Room	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Front Entrance	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.33	1,007	0.0	$140.13	$717.60	$120.00	4.26
Front Entrance	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	None	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Corridor - Computer Lab	13	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	Yes	13	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,225	0.07	200	0.0	$27.85	$116.00	$0.00	4.17
Corridor - Computer Lab	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Corridor - Science	12	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	Yes	12	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,225	0.06	185	0.0	$25.71	$116.00	$0.00	4.51
Corridor - Science	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Corridor - Upper Wing	26	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	Yes	26	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,225	0.13	400	0.0	$55.70	$232.00	$0.00	4.17
Corridor - Upper Wing	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 108	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Room 106	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Room 105	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Room 107	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Room 104	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Room 103	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Closet	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,750	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.13	409	0.0	$56.88	$467.00	$30.00	7.68
Custodian	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.05	168	0.0	$23.36	$233.00	$20.00	9.12

	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 109	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Boys Restroom	5	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,750	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.22	681	0.0	$94.79	$701.00	$50.00	6.87
Girls Restroom	5	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,750	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.22	681	0.0	$94.79	$701.00	$50.00	6.87
Room 110	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Room 111	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Room 101	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Room 102	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.49	1,511	0.0	$210.20	$1,169.00	$200.00	4.61
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,750	0.04	133	0.0	$18.48	$117.00	$20.00	5.25
Storage	1	Incandescent: 300W Screen in Lamp	Wall Switch	300	1,750	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	45	1,750	0.17	513	0.0	$71.41	$63.65	$5.00	0.82
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,750	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,750	0.02	70	0.0	$9.80	$71.80	$10.00	6.31
Fourniture Storage	2	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch	110	1,750	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.12	361	0.0	$50.24	$233.00	$20.00	4.24
Reference Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.11	336	0.0	$46.71	$350.00	$60.00	6.21
Teacher Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.11	336	0.0	$46.71	$350.00	$60.00	6.21
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.05	168	0.0	$23.36	$233.00	$20.00	9.12
Break Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.11	336	0.0	$46.71	$350.00	$60.00	6.21
Corridor - Break Room	2	Incandescent: 100W Scree in	Wall Switch	100	1,750	Relamp	No	2	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	15	1,750	0.11	342	0.0	$47.61	$127.30	$10.00	2.46
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,750	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,225	0.03	88	0.0	$12.24	$187.80	$10.00	14.53
Copy Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,750	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,225	0.11	352	0.0	$48.95	$403.20	$60.00	7.01
Auditorium	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,750	Relamp	No	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,750	0.37	1,127	0.0	$156.82	$951.33	$200.00	4.79
Auditorium	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stage	22	LED - Fixtures: Track or Mono-Point Directional Lighting Fixtures	Wall Switch	7	1,750	None	No	22	LED - Fixtures: Track or Mono-Point Directional Lighting Fixtures	Wall Switch	7	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stage	8	Compact Fluorescent: 23W Screen in	Wall Switch	23	1,750	Relamp	No	8	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	9	1,750	0.07	225	0.0	$31.36	$509.20	$40.00	14.96
Cafeteria	39	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,750	Relamp	Yes	39	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,225	0.56	1,715	0.0	$238.64	$1,632.10	$235.00	5.85
Cafeteria	14	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,750	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,750	0.04	113	0.0	$15.68	$819.00	$140.00	43.30
Cafeteria	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	21	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,000	Relamp	No	21	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,000	0.24	845	0.0	$117.62	$753.90	$105.00	5.52
Kitchen	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	8	Incandescent: 60W Screen in	Wall Switch	60	1,750	Relamp	No	8	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	9	1,750	0.27	821	0.0	$114.26	$509.20	$40.00	4.11
Diswasher Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.06	199	0.0	$27.72	$150.40	$30.00	4.34
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.03	100	0.0	$13.86	$75.20	$15.00	4.34
Walk in Refrigerator	2	Incandescent: 60W Screen in	Wall Switch	60	1,750	Relamp	No	2	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	9	1,750	0.07	205	0.0	$28.56	$127.30	$10.00	4.11
Boys Restroom	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	No	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boys Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.03	100	0.0	$13.86	$75.20	$15.00	4.34
Girls Restroom	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	No	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Guidance Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.16	504	0.0	$70.07	$416.80	$80.00	4.81
Children Study Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.06	199	0.0	$27.72	$150.40	$30.00	4.34
Children Study Room	6	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	None	No	6	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Computer Lab	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.82	2,518	0.0	$350.33	$1,987.00	$340.00	4.70
Computer Lab	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.06	199	0.0	$27.72	$150.40	$30.00	4.34
Mrs, Bearry Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.16	504	0.0	$70.07	$416.80	$80.00	4.81
Mrs, Bearry Room	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,750	0.02	66	0.0	$9.24	$58.50	$10.00	5.25
Room 4	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.29	881	0.0	$122.62	$642.40	$125.00	4.22
Mrs Hemsley Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,400	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	980	0.16	403	0.0	$56.05	$416.80	$80.00	6.01
Mrs Hemsley Room	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Server Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.03	100	0.0	$13.86	$75.20	$15.00	4.34
Board Office	18	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	None	Yes	18	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,225	0.06	185	0.0	$25.71	$116.00	$20.00	3.73
Board Office	8	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	No	8	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	1,750	0.15	467	0.0	$64.97	$505.60	$0.00	7.78
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,750	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,750	0.01	35	0.0	$4.90	$35.90	$5.00	6.31
Library	9	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	None	No	9	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Library	48	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	48	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	1.97	6,042	0.0	$840.80	$3,841.60	$760.00	3.67
Library Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.16	504	0.0	$70.07	$416.80	$80.00	4.81
Library	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.26	797	0.0	$110.90	$601.60	$120.00	4.34
Conference Room	6	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	None	Yes	6	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,225	0.02	62	0.0	$8.57	$116.00	$20.00	11.20
Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.06	199	0.0	$27.72	$150.40	$30.00	4.34
Corridor	5	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	No	5	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	1,750	0.10	292	0.0	$40.61	$316.00	$0.00	7.78
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.03	100	0.0	$13.86	$75.20	$15.00	4.34
Assistant Principal office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.16	504	0.0	$70.07	$416.80	$80.00	4.81
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,750	0.04	133	0.0	$18.48	$117.00	$20.00	5.25
Main Office	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Nurse Room	5	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	5	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,225	0.13	391	0.0	$54.47	$432.00	$20.00	7.56
Nurse Room	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,750	0.23	697	0.0	$97.04	$526.40	$105.00	4.34
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,750	0.02	66	0.0	$9.24	$58.50	$10.00	5.25
Boys Restroom	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.12	378	0.0	$52.55	$341.60	$45.00	5.64
Girls Restroom	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.12	378	0.0	$52.55	$341.60	$45.00	5.64
Janitorial Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,750	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,750	0.01	32	0.0	$4.48	$48.20	$10.00	8.53
Room 7	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 9	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 11	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 10	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 12	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 13	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74

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Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 14	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 15	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 16	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 19	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 19	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	No	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 17	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 17	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	No	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 18	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 18	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	No	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 20	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.74	2,266	0.0	$315.30	$1,469.60	$290.00	3.74
Room 20	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	None	No	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,750	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 22	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.33	1,007	0.0	$140.13	$717.60	$140.00	4.12
Room 24	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.82	2,518	0.0	$350.33	$1,620.00	$320.00	3.71
Gymnasium	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gymnasium	15	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	120	1,750	Relamp	No	15	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,750	0.61	1,872	0.0	$260.44	$1,427.00	$300.00	4.33
Boys Locker Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.08	252	0.0	$35.03	$266.40	$30.00	6.75
Girls locker Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.08	252	0.0	$35.03	$266.40	$30.00	6.75
Gymn Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.08	252	0.0	$35.03	$266.40	$50.00	6.18
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,750	0.02	66	0.0	$9.24	$58.50	$10.00	5.25
Band Room	40	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	40	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	1.64	5,035	0.0	$700.67	$3,124.00	$620.00	3.57
Band Room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.08	252	0.0	$35.03	$266.40	$50.00	6.18
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	0.16	504	0.0	$70.07	$416.80	$60.00	5.09
Art Room	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,750	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,225	1.23	3,776	0.0	$525.50	$2,488.00	$490.00	3.80
Art Room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	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
Mr. saccheta Room	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.66	2,014	0.0	$280.27	$1,520.00	$260.00	4.50
Mrs. Mixner Room	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.66	2,014	0.0	$280.27	$1,520.00	$260.00	4.50
Mrs. Taulane Room	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.66	2,014	0.0	$280.27	$1,520.00	$260.00	4.50
Mr. McFarland	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.44	1,343	0.0	$186.84	$1,052.00	$180.00	4.67
Closet	1	Incandescent: 60W Screen in	Wall Switch	60	1,750	Relamp	No	1	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	9	1,750	0.03	103	0.0	$14.28	$63.65	$5.00	4.11
Boiler Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,225	0.22	671	0.0	$93.42	$584.00	$100.00	5.18
Electrical Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,750	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,750	0.04	133	0.0	$18.48	$117.00	$20.00	5.25
Exterior Entrance	25	LED - Fixtures: Downlight Recessed	Daylight Dimming	11	2,912	None	No	25	LED - Fixtures: Downlight Recessed	Daylight Dimming	11	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior Perimeter	23	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	9	2,912	None	No	23	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	9	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pole Lighting	3	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	85	2,912	None	No	3	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	85	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pole Lighting	21	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	65	2,912	None	No	21	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	65	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Maintenance Shop	School Building	2	Condenser Water Pump	30.0	93.6%	Yes	920	No	93.6%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage	Geothermal Heat Pump	1	Water Supply Pump	7.5	88.0%	Yes	1,840	No	88.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Janitorial Closet	School Building	1	Other	0.8	65.0%	No	1,840	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Locker Room	1	Exhaust Fan	0.8	65.0%	No	1,840	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Science Lab	1	Exhaust Fan	0.8	65.0%	No	1,840	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Kitchen	1	Kitchen Hood Exhaust Fan	3.0	82.0%	No	1,840	No	82.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Diswasher Room	1	Exhaust Fan	0.8	65.0%	No	1,840	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	School Classroom	13	Other	0.5	65.0%	No	1,840	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	ERU 2, 4, 5, 6, 7	5	Process Blower	3.0	86.0%	No	1,840	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	ERU 2, 4, 5, 6, 7	5	Exhaust Fan	3.0	86.0%	No	1,840	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	ERU 1, 3	2	Process Blower	2.0	86.0%	No	1,840	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	ERU 1, 3	2	Exhaust Fan	2.0	86.0%	No	1,840	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	ERU 8	5	Process Blower	2.0	86.0%	No	1,840	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	ERU 8	5	Exhaust Fan	2.0	86.0%	No	1,840	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Rooftop	School	1	Packaged AC	10.00		Yes	1	Packaged AC	10.00		11.50		Yes	4.38	9,179	0.0	$1,277.34	$18,571.06	$980.00	13.77
School	Classroom Unit Ventilators	13	Groundwater Source HP	4.00	43.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Tuller	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Conroy	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Kirkendoll	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Lewis	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - McGroarty	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Kozarsky	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Knorr	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Porreca	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Donahue	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Cullen	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Quinn	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Boeckle	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Nurse Room	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Library Office	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Library South	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Mian Office	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	District Office	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Library East	1	Groundwater Source HP	1.25	11.46	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
School	Computer/Server Rooms	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Ayers	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Conference Room	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classrooms - CST/Bearry	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Computer	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Guidance Room	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Office - Conover	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Gymn Office	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Gymn South	1	Groundwater Source HP	3.00	33.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Gymn North	1	Groundwater Source HP	3.00	33.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Music East	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Music West	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Art Room	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Lower Wing Hallway	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Gymn Hallway	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Main Hallway	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	All Purpose Room Rear	1	Groundwater Source HP	3.00	33.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	All Purpose Room Front	1	Groundwater Source HP	3.00	33.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Spare	1	Groundwater Source HP	3.00	18.30	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Nurse Hall West	1	Groundwater Source HP	1.25	11.46	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
School	Mian Entrance	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Coombs	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Hackett	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Cafeteria 1	1	Groundwater Source HP	3.00	33.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Cafeteria 2	1	Groundwater Source HP	3.00	33.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Storage Hallway	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Old Wing Hallway North	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Arrizon	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Science Lab/Taulane	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Kitchen Back	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Kitchen Front	1	Groundwater Source HP	1.25	11.46	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School	Classroom - Shaw	1	Groundwater Source HP	1.25	11.46	No							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
Sanitorial Closet	New Wing of the building	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Old Wing of the building	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
School Building	17	Faucet Aerator (Lavatory)	2.20	1.00	0.00	5,896	0.0	$820.46	$121.89	$0.00	0.15

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions			Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Low Temp Freezer (-35F to -5F)	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Cooler (35F to 55F)	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
Cafeteria	1	Refrigerator Chest	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Refrigerator, Solid Door (>50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Refrigerator Chest	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	2	Refrigerator Chest	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Novelty Cooler Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Cooler Description	Install Automatic Shutoff Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Teacher Room	1	Small Cooler	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	Propane Convection Oven (Full Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	2	Propane Convection Oven (Full Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Propane Steamer	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Insulated Food Holding Cabinet (Full 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	Single Tank Conveyor (Low Temp)	Electric	N/A	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
School	4	Microwave	1,000.0	Yes
School	5	Coffee Machine	950.0	No
School	4	Small Freezer	127.0	Yes
School	7	Printer	200.0	Yes
School	250	Desktop With LCD Monitor	191.0	Yes
School	6	Copy Machine	900.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Copy Room	1	Refrigerated	Yes	0.00	1,612	0.0	$224.29	$230.00	$0.00	1.03
Copy Room	1	Non-Refrigerated	Yes	0.00	343	0.0	$47.66	$230.00	$0.00	4.83

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Upper Pittsgrove Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 77,870
Built: 1962

For Year Ending: June 30, 2016
Date Generated: September 28, 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
Upper Pittsgrove Elementary School 235 Pine Tavern Road Monroeville, New Jersey 08343	_____ . (___)___-_____	____ _____ . (___)___-_____ _____

Property ID: 6057814

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
28.3 kBtu/ft²

Source EUI
84.5 kBtu/ft²

Annual Energy by Fuel

Propane (kBtu)	44,730 (2%)
Electric - Grid (kBtu)	2,046,436 (93%)
Electric - Solar (kBtu)	108,923 (5%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	40.9
National Median Source EUI (kBtu/ft²)	122.4
% Diff from National Median Source EUI	-31%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	230

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)