Local Government Energy Audit:
Energy Audit Report

George Washington Elementary School

1530 Leslie St.

Hillside, NJ 07205

Hillside Board of Education

September 25, 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 measure.

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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 the George Washington 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 public schools in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

The George Washington Elementary School is a 45,080 square-foot, two-story (plus basement), Grade 5 elementary school. The school is mainly comprised of classrooms, administrative offices, gym, and cafeteria/kitchen. The various spaces are connected by covered corridors/hallways and stairwells.

Lighting at the George Washington Elementary School consists primarily of T8 fluorescent sources, which are inefficient compared to currently available alternatives. Heating in the classrooms and offices is mainly provided by unit ventilators, baseboard radiators and split system air-source heat pump units. Cooling is provided by the split system air-source heat pump units and window A/C units. A thorough description of the facility and our observations are in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated four measures which together represent an opportunity for the George Washington Elementary School to reduce annual energy costs by $5,578 and annual greenhouse gas emissions by 34,000 lbs. CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 8.4 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce the George Washington Elementary School's annual energy use by 4%.

Figure 1 – Previous 12 Month Utility Costs

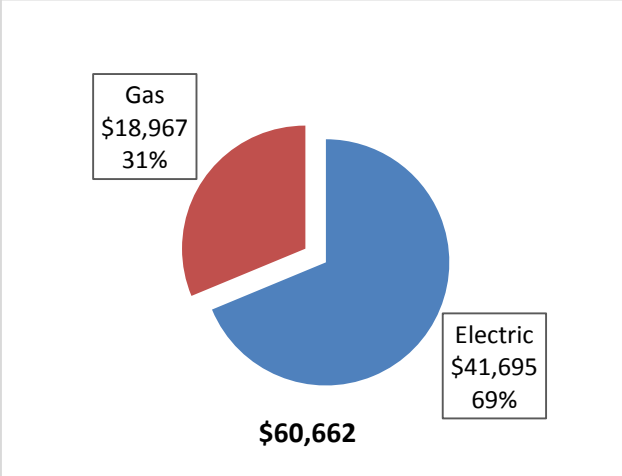
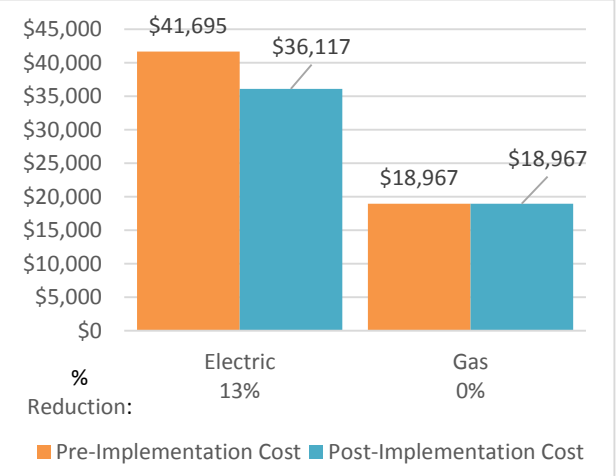


Figure 2 – Potential Post-Implementation Costs



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

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

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**30,238**	**14.0**	**0.0**	**$4,995.18**	**$44,152.12**	**$7,635.00**	**$36,517.12**	**7.3**	**30,449**
ECM 1	Install LED Fixtures	Yes	1,248	0.2	0.0	$206.22	$781.35	$200.00	$581.35	2.8	1,257
ECM 2	Retrofit Fixtures with LED Lamps	Yes	28,989	13.8	0.0	$4,788.96	$43,370.77	$7,435.00	$35,935.77	7.5	29,192
Lighting Control Measures			**3,526**	**1.4**	**0.0**	**$582.47**	**$11,434.00**	**$1,165.00**	**$10,269.00**	**17.6**	**3,551**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	2,673	1.0	0.0	$441.57	$8,834.00	$1,165.00	$7,669.00	17.4	2,692
ECM 4	Install High/Low Lighitng Controls	Yes	853	0.3	0.0	$140.90	$2,600.00	$0.00	$2,600.00	18.5	859
TOTALS			**33,764**	**15.4**	**0.0**	**$5,577.65**	**$55,586.12**	**$8,800.00**	**$46,786.12**	**8.4**	**34,000**

* - 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.

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 the George Washington 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
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Repair/Replace Steam Traps
- Perform Regular Boiler Maintenance
- Perform Water Heater Maintenance
- Install Plug Load Controls
- Water Conservation

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

On-Site Generation Measures

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

Figure 4 – Photovoltaic Potential

Potential	Medium	
System Potential	70	kW DC STC
Electric Generation	83,396	kWh/yr
Displaced Cost	$7,260	/yr
Installed Cost	$236,600	

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
- Direct Install
- SREC (Solar Renewable Energy Certificate) Registration Program (SRP)
- Energy Savings Improvement Program (ESIP)

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

This facility may also qualify for the Direct Install program which can provide turnkey installation of multiple measures, through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures, although measure eligibility will have to be assessed and be verified by the designated Direct Install contractor and, in most cases, they will perform the installation work.

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.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce electric loads at commercial facilities, when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. Demand Response (DR) 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 commercial facilities to reduce their 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 facilities receive payments if they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

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

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Darice Gonzalez	School Business Administrator/Bd Sec	dgonzalez@hillsidek12.org	908-352-7664 ext 6429
TRC Energy Services			
Alexander Klieverik	Auditor	AKlieverik@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On March 09, 2018, TRC performed an energy audit at the George Washington Elementary School located in Hillside, New Jersey. TRC's team met with David DeFluri, District Facility Manager for Hillside BOE to review the facility operations and help focus our investigation on specific energy-using systems.

2.3 Building Occupancy

The school building is open Monday through Friday from approximately 9:00 AM through 3:00 PM during the school year, September through June. The building is occasionally occupied on the weekend. During a typical day, the facility is occupied by 30 staff and 203 students.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
George Washington Elementary School	Weekday	9:00 am - 2:30 pm
George Washington Elementary School	Weekend	9:00 am - 1:00 pm

2.4 Building Envelope

The George Washington Elementary School building was constructed in 1931 and last renovated in 2017. The building is constructed of concrete block with a brick façade. The middle of the building has a pitched roof and the ends have flat roof sections. The building has double paned windows which are in good condition. The exterior doors are constructed of aluminum and tempered glass in good condition.

Image 1 – Building Envelope

Image 2 – Roof

2.5 On-Site Generation

The George Washington Elementary School does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

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

Lighting System

Interior lighting at the facility is provided mostly by linear fluorescent T8 lamps with electronic ballasts and compact fluorescent (CFL) fixtures with 2-pin lamps. The linear fluorescent fixtures are in all areas of the building. The exterior lighting is provided by LED wallpacks and are controlled by photocells.

Lighting control in all interior spaces is provided mainly by manual switches and occupancy sensors. The occupancy sensors are located in classrooms and restrooms. The LED exit signs operate 24 hours per day.

Image 3 – T8 Fluorescent Lighting

Image 4 – Exterior LED Wallpack

Steam and Heating Hot Water System

The steam heating system consists of two Weil McLain steam boilers, each with a 2,904 kBtu/hr. rated output. The boilers are forced draft and have a nominal combustion efficiency of 80%. The steam is used to produce heating hot water (HHW) using a heat exchanger. The HHW circulates through baseboards and fan coil units located throughout the building.

Image 5 – Steam Boilers

Image 6 – Baseboard Heaters

Direct Expansion Air Conditioning System (DX)

There are 20 window air conditioners located throughout the building to provide space cooling mainly for the classrooms and offices. These stand-alone systems are independently controlled. The DX systems are approximately 1-ton capacity and about ten years old.

There are 13 Split-System Air-Source Heat Pump (ASHP) systems serving the classrooms and offices throughout the building. The outdoor coils are located on the north-west side of the building. The cooling capacity for the units vary from 1.5 to 12 tons. The systems are controlled by thermostats in the area near the indoor coil unit.

Two 17.5 ton and one 3 ton direct-expansion package air-conditioning units are used to condition the gymnasium. The units have a natural gas-fired furnace and outside air economizer. The units are located on the roof of the building. There is an energy recovery ventilator (ERV) on the roof adjacent to the 3 ton package unit.

Both the ASHP split systems and the packaged AC units were new (two years old) and in good condition.

Image 7 – Window AC and baseboard (Office)

Image 8 – Roof Top Unit #2 (Serves Gym)

Domestic Hot Water Heating System

The domestic hot water heating systems for the facility consists of two natural gas-fired storage tank water heaters. The water heaters serve the kitchen and restrooms. Each water heater has a 75-gallon storage capacity, an output rating of 61 kBtu/hr. and a nominal efficiency of 80%.

Food Service & Laundry Equipment

The school has a kitchen that is used to prepare approximately 500 lunches per day for the students and staff. Most of the cooking is done using the two gas ovens/steamers and the single large stove.

Refrigeration

The kitchen has several relatively new refrigerators and coolers.

Building Plug Load

There are roughly 23 laptops and 56 computer work stations throughout the facility. Most of the classrooms have smart-boards (24) and projectors (20). There is also office equipment (copiers, printers, etc.) and small refrigerators located throughout the school.

3 Site Energy Use and Costs

Utility data for electricity and natural gas was analyzed to identify opportunities for savings. In addition, data for electricity and natural gas was evaluated to determine the annual energy performance metrics for the building in energy cost per square foot and energy usage per square foot. These metrics are an estimate of the relative energy efficiency of this building. There are many 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

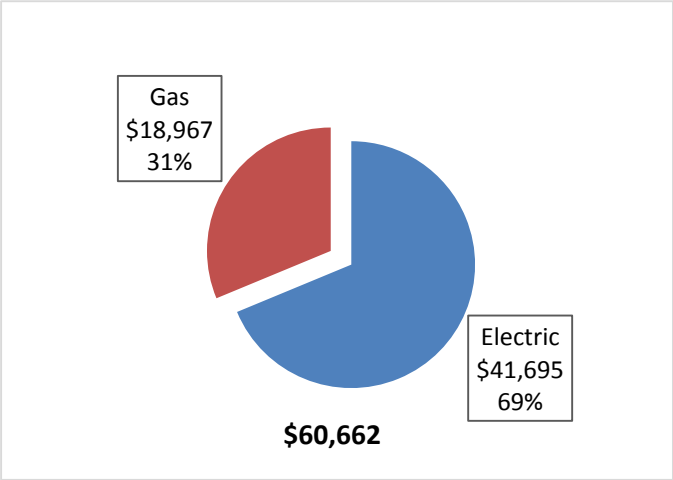
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for George Washington Elementary School		
Fuel	**Usage**	**Cost**
Electricity	252,394 kWh	$41,695
Natural Gas	21,228 Therms	$18,967
Total		**$60,662**

The current annual energy cost for this facility is $60,662 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by PSE&G. The average electric cost over the past 12 months was $0.165/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. There was one bill (April 2017) in which the usage was lower than normal. There was a change in meters therefore there might have been an issue with the meter or shift in the usage. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 9 - Electric Usage & Demand

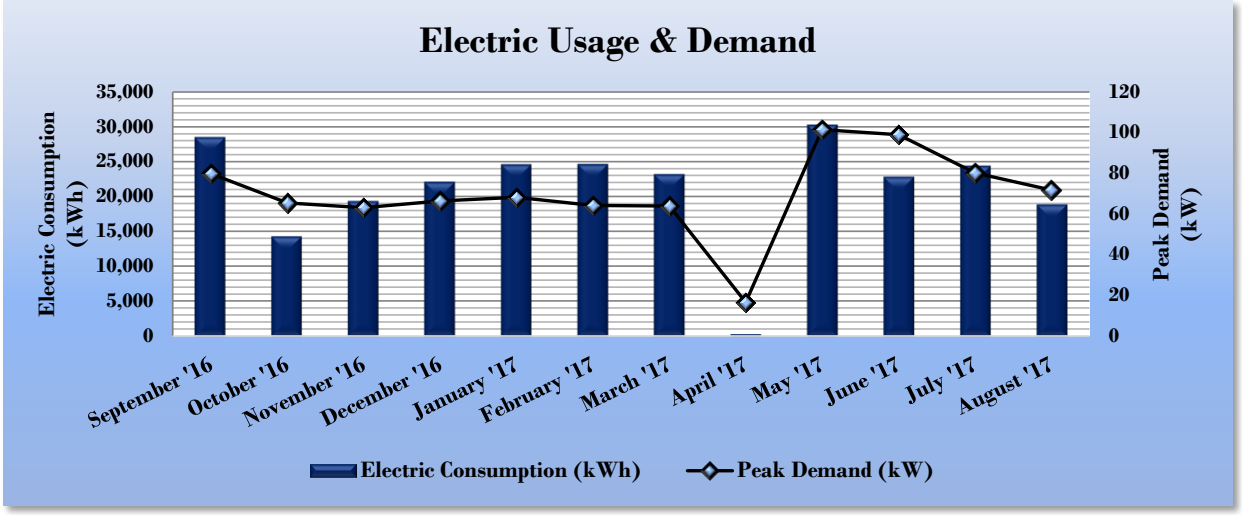


Figure 10 - Months Electric Usage & Demand

Electric Billing Data for George Washington Elementary School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
9/28/16	30	28,380	80	$356	$4,256
10/27/16	29	14,250	65	$292	$2,198
11/29/16	33	19,260	63	$281	$2,537
12/29/16	30	22,020	66	$296	$2,784
1/30/17	32	24,510	68	$304	$3,067
3/1/17	30	24,570	64	$287	$3,044
3/30/17	29	23,100	64	$288	$3,010
5/1/17	32	300	17	$74	$1,014
5/31/17	30	30,149	101	$726	$6,738
6/29/17	29	22,754	99	$373	$4,676
7/31/17	32	24,313	80	$302	$4,500
8/29/17	29	18,788	72	$270	$3,873
Totals	**365**	**252,394**	**101.4**	**$3,850**	**$41,695**
Annual	**365**	**252,394**	**101.4**	**$3,850**	**$41,695**

3.3 Natural Gas Usage

Natural gas is provided by Elizabethtown Gas. The average gas cost for the past 12 months is $0.893/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 11 - Natural Gas Usage

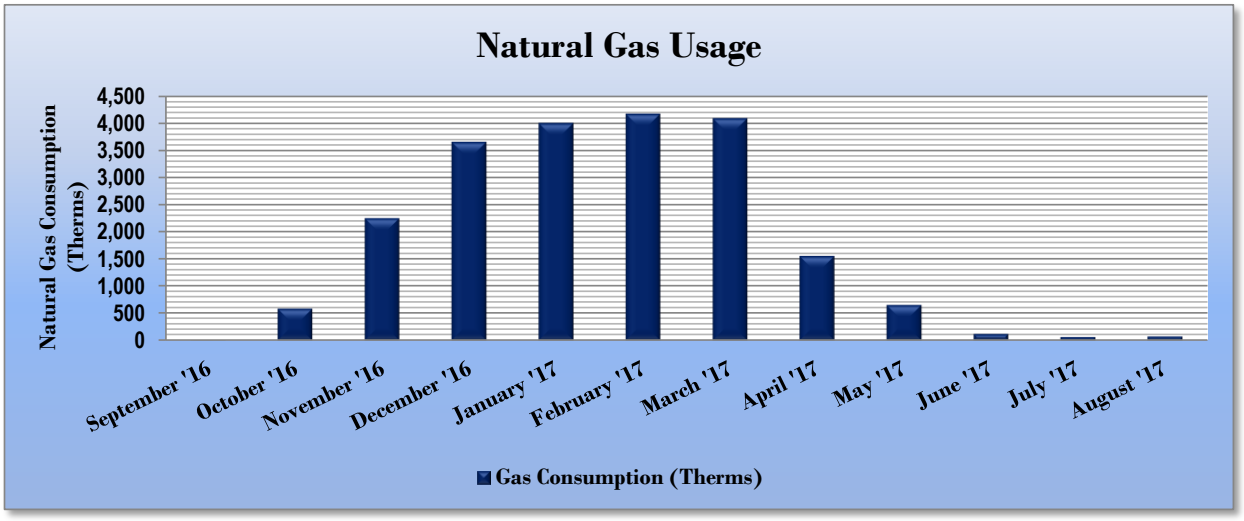


Figure 12 - Natural Gas Usage

Gas Billing Data for George Washington Elementary School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
9/29/16	30	3	$393
10/28/16	29	581	$626
11/30/16	33	2,243	$1,816
12/29/16	29	3,649	$3,004
1/27/17	29	3,996	$3,544
2/27/17	31	4,168	$3,520
3/28/17	29	4,082	$3,092
4/27/17	30	1,551	$1,415
5/30/17	33	652	$692
6/28/17	29	117	$285
7/28/17	30	60	$274
8/29/17	32	68	$254
Totals	**364**	**21,170**	**$18,915**
Annual	**365**	**21,228**	**$18,967**

3.4 Benchmarking

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

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

Figure 13 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	George Washington Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	109.4	141.4
Site Energy Use Intensity (kBtu/ft^2)	66.2	58.2

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

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

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	George Washington Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	101.4	141.4
Site Energy Use Intensity (kBtu/ft^2)	63.6	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75% of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 62.

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

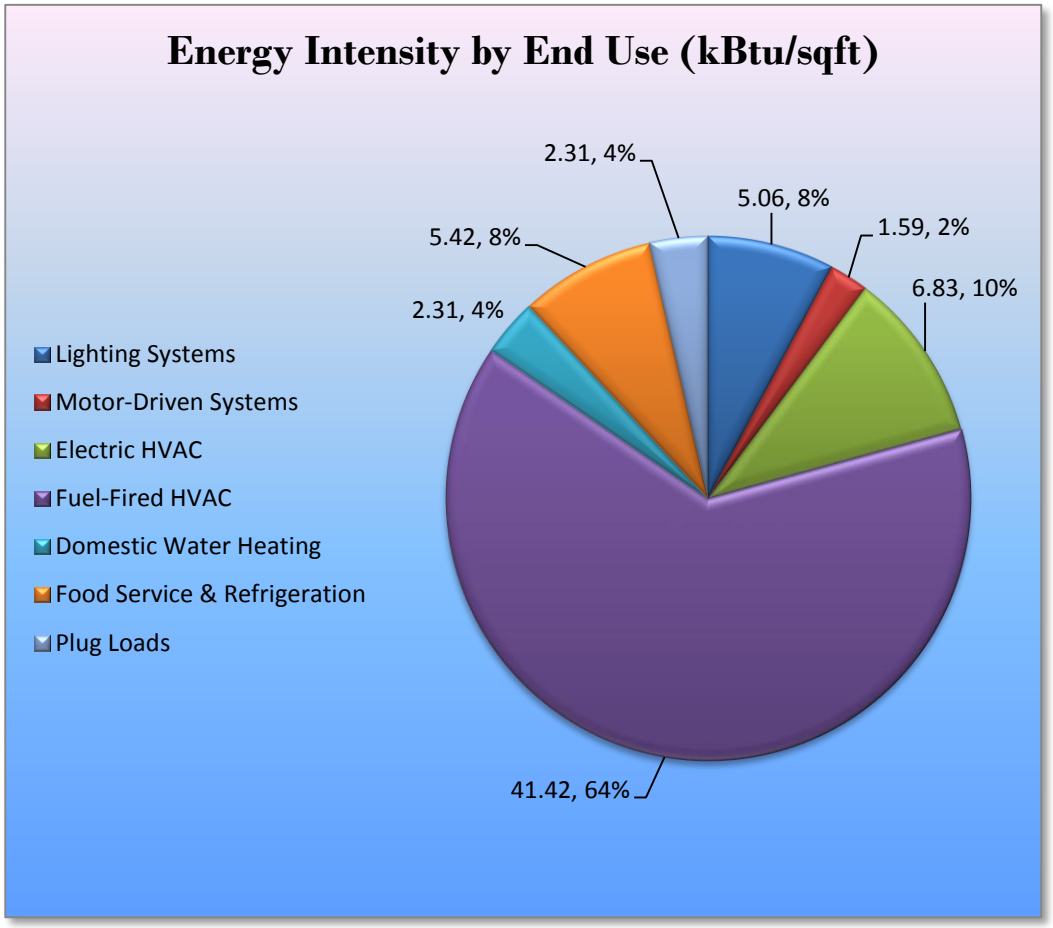
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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

3.5 Energy End-Use Breakdown

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

Figure 15 - Energy Balance (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 George Washington Elementary School regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016, approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances. A higher level of investigation may be necessary to support any custom SmartStart or Pay for Performance, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 8.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 16 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**30,238**	**14.0**	**0.0**	**$4,995.18**	**$44,152.12**	**$7,635.00**	**$36,517.12**	**7.3**	**30,449**
ECM 1	Install LED Fixtures	1,248	0.2	0.0	$206.22	$781.35	$200.00	$581.35	2.8	1,257
ECM 2	Retrofit Fixtures with LED Lamps	28,989	13.8	0.0	$4,788.96	$43,370.77	$7,435.00	$35,935.77	7.5	29,192
Lighting Control Measures		**3,526**	**1.4**	**0.0**	**$582.47**	**$11,434.00**	**$1,165.00**	**$10,269.00**	**17.6**	**3,551**
ECM 3	Install Occupancy Sensor Lighting Controls	2,673	1.0	0.0	$441.57	$8,834.00	$1,165.00	$7,669.00	17.4	2,692
ECM 4	Install High/Low Lighitng Controls	853	0.3	0.0	$140.90	$2,600.00	$0.00	$2,600.00	18.5	859
TOTALS		**33,764**	**15.4**	**0.0**	**$5,577.65**	**$55,586.12**	**$8,800.00**	**$46,786.12**	**8.4**	**34,000**

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

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

4.1.1 Lighting Upgrades

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

Figure 17 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**30,238**	**14.0**	**0.0**	**$4,995.18**	**$44,152.12**	**$7,635.00**	**$36,517.12**	**7.3**	**30,449**
ECM 1	Install LED Fixtures	1,248	0.2	0.0	$206.22	$781.35	$200.00	$581.35	2.8	1,257
ECM 2	Retrofit Fixtures with LED Lamps	28,989	13.8	0.0	$4,788.96	$43,370.77	$7,435.00	$35,935.77	7.5	29,192

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

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0
Exterior	1,248	0.2	0.0	$206.22	$781.35	$200.00	$581.35	2.8	1,257

Measure Description

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

Additional savings from lighting maintenance can be anticipated since LED lifecycles are longer that other lighting technologies

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	28,989	13.8	0.0	$4,788.96	$43,370.77	$7,435.00	$35,935.77	7.5	29,192
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend retrofitting existing fluorescent and incandescent fixtures 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 lifecycles are more than twice that of fluorescent tubes and more than ten times longer than many incandescent lamps.

4.1.2 Lighting Control Measures

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

Figure 18 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**3,526**	**1.4**	**0.0**	**$582.47**	**$11,434.00**	**$1,165.00**	**$10,269.00**	**17.6**	**3,551**
ECM 3	Install Occupancy Sensor Lighting Controls	2,673	1.0	0.0	$441.57	$8,834.00	$1,165.00	$7,669.00	17.4	2,692
ECM 4	Install High/Low Lighitng Controls	853	0.3	0.0	$140.90	$2,600.00	$0.00	$2,600.00	18.5	859

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)
2,673	1.0	0.0	$441.57	$8,834.00	$1,165.00	$7,669.00	17.4	2,692

Measure Description

We typically recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in most restrooms, storage rooms, classrooms, offices areas, etc. Lighting sensors detect occupancy using ultrasonic and/or infrared sensors. For most spaces, we recommend lighting controls use dual technology sensors, which can eliminate the possibility of any lights turning off unexpectedly. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Some controls also provide dimming options and all modern occupancy controls can be easily over-ridden by room occupants to allow them to manually turn fixtures on or off, as desired. Energy savings results from only operating lighting systems when they are required.

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

ECM 4: Install High/Low Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
853	0.3	0.0	$140.90	$2,600.00	$0.00	$2,600.00	18.5	859

Measure Description

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

Lighting fixtures with these controls operate at default low levels when the area is not occupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. The lighting systems are switched to full lighting levels whenever an occupant is detected. Fixtures are automatically switched back to low level after an area has been vacant for a preset period of time. In parking lots and parking garages with significant ambient lighting this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylighting. Energy savings results from only providing full lighting levels when it is required.

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

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

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.

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.

Repair/Replace Steam Traps

Properly functioning steam traps ensure that all latent heat in the steam is delivered to the end use by preventing pressurized steam from leaking. Steam traps should be inspected as part of the regular steam system maintenance. Traps that are blocked, venting, or allowing steam to leak through should be repaired or replaced. Repairing or replacing existing steam traps will reduce steam losses.

Perform Regular Boiler Maintenance

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

Perform Water Heater Maintenance

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

Plug Load Controls

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

Water Conservation

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

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

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.

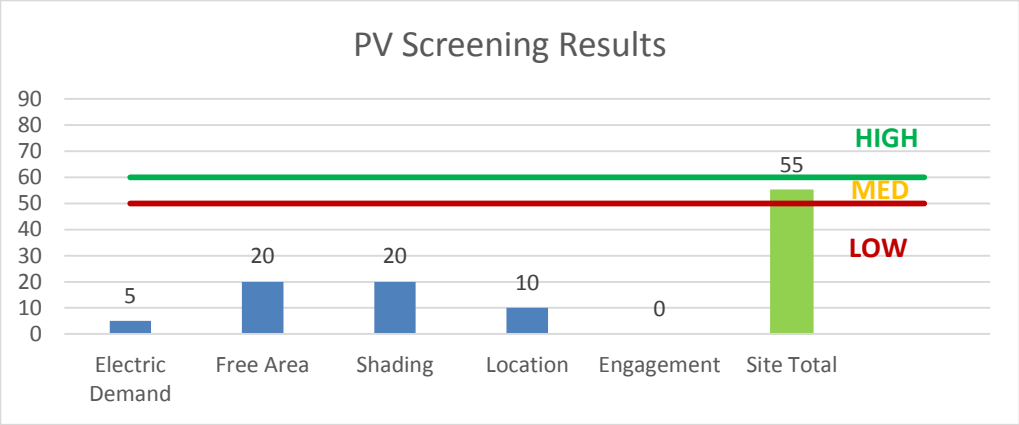
Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before deciding to implement, a feasibility study should be conducted that would take a detailed look at existing energy profiles, siting, interconnection,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

6.1 Photovoltaic

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

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has a Medium potential for installing a PV array. A PV array located on the roof of the main building may be feasible. If the George Washington Elementary School is interested in pursuing the installation of PV, we recommended conducting a more detailed feasibility study.

Figure 19 - Photovoltaic Screening



Potential	Medium	
System Potential	70	kW DC STC
Electric Generation	83,396	kWh/yr
Displaced Cost	$7,260	/yr
Installed Cost	$236,600	

Solar projects must register their projects in the SREC (Solar Renewable Energy Certificate) Registration Program (SRP) prior to the start of construction 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

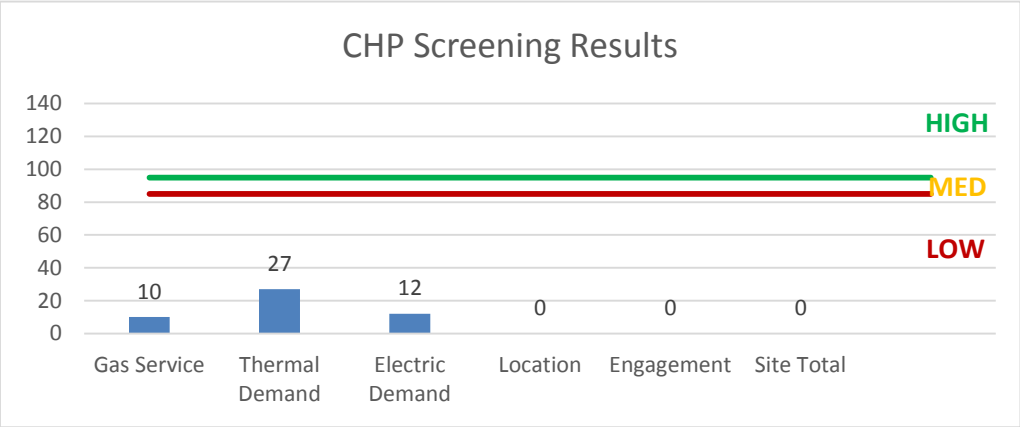
Combined heat and power (CHP) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric 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 space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for 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. The infrequent thermal load and lack of space near the existing boilers are the most significant factors contributing to the potential for CHP at the site. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

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

Figure 20 - 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 21 for a list of the eligible programs identified for each recommended ECM.

Figure 21 - ECM Incentive Program Eligibility

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

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

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

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

8.1 SmartStart

Overview

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

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

8.2 Direct Install

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

Incentives

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

How to Participate

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

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

8.3 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SRP prior to the start of construction 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. SRECs 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 SRECs 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 description 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 of 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 monthly. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third party supplier for natural gas commodity.

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
VP Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.02	49	0.0	$8.04	$58.50	$10.00	6.03
CR 207	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.48	862	0.0	$142.33	$1,287.00	$220.00	7.50
CR 206	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.60	1,555	0.0	$256.93	$2,367.00	$360.00	7.81
CR 205	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.60	1,555	0.0	$256.93	$2,367.00	$360.00	7.81
CR 208	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.60	1,555	0.0	$256.93	$2,367.00	$360.00	7.81
CR 204	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.41	1,060	0.0	$175.18	$1,687.50	$255.00	8.18
Boys RR	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	31	1,474	0.02	53	0.0	$8.68	$150.00	$0.00	17.28
Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.08	212	0.0	$35.04	$445.50	$65.00	10.86
Custodian Closet	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Custodial/Storage	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
Teachers Lounge	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,474	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,032	0.25	636	0.0	$105.11	$721.20	$125.00	5.67
Faculty RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
CR203 B/A	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.26	470	0.0	$77.63	$702.00	$120.00	7.50
Storage Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,032	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,032	0.10	176	0.0	$29.11	$225.60	$45.00	6.20
CR 202	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.60	1,555	0.0	$256.93	$2,367.00	$360.00	7.81
CR 209	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.48	862	0.0	$142.33	$1,287.00	$220.00	7.50
CR 201	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.48	862	0.0	$142.33	$1,287.00	$220.00	7.50
CR 210	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.48	862	0.0	$142.33	$1,287.00	$220.00	7.50
Room x (2B)	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,474	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,474	0.04	95	0.0	$15.68	$95.13	$20.00	4.79
Stairwell B	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,474	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,474	0.04	95	0.0	$15.68	$95.13	$20.00	4.79
Stairwell B	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.06	168	0.0	$27.73	$175.50	$30.00	5.25
2nd Floor Hall	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,032	0.46	1,202	0.0	$198.54	$1,594.50	$170.00	7.17
2nd Floor Hall	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
Stairwell A	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,474	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,474	0.04	95	0.0	$15.68	$95.13	$20.00	4.79

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Stairwell A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.06	168	0.0	$27.73	$175.50	$30.00	5.25
Guidance Area_Corridor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.02	39	0.0	$6.47	$58.50	$10.00	7.50
Guidance Area_Conf. Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.09	157	0.0	$25.88	$234.00	$40.00	7.50
Guidance Area_Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.09	157	0.0	$25.88	$234.00	$40.00	7.50
Guidance Area_CR 113	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.48	862	0.0	$142.33	$1,287.00	$220.00	7.50
Guidance Area_CR 114 (Life Skills)	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.39	705	0.0	$116.45	$1,053.00	$180.00	7.50
Guidance Area_CR 103	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.49	1,273	0.0	$210.22	$2,133.00	$320.00	8.62
Guidance Area_Boys RR	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	31	1,474	0.02	53	0.0	$8.68	$150.00	$0.00	17.28
Guidance Area_Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.08	212	0.0	$35.04	$445.50	$65.00	10.86
Guidance Area_Custodian Closet	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
Guidance Area_Custodial/Storage	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
Guidance Area_Nurses Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,032	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,032	0.19	352	0.0	$58.23	$451.20	$90.00	6.20
Guidance Area_Nurses Office-RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.02	39	0.0	$6.47	$58.50	$10.00	7.50
Guidance Area_Conference Area	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.11	283	0.0	$46.71	$350.00	$60.00	6.21
Guidance Area_Conference Area - RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
Guidance Area_Office 2A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.04	112	0.0	$18.48	$117.00	$20.00	5.25
Guidance Area_Office 2A-RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
Guidance Area_Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,474	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,474	0.02	59	0.0	$9.80	$71.80	$10.00	6.30
Main Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.14	353	0.0	$58.39	$562.50	$85.00	8.18
Main Office -RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
Principals Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,474	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,032	0.10	249	0.0	$41.11	$306.27	$60.00	5.99
Principals Office-RR	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.02	54	0.0	$8.96	$96.40	$20.00	8.52
Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,032	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,032	0.10	176	0.0	$29.11	$225.60	$45.00	6.20
Custodial Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
CR 102	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.48	862	0.0	$142.33	$1,287.00	$220.00	7.50

	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
115 A/B	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.26	470	0.0	$77.63	$702.00	$120.00	7.50
CR 101	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.48	862	0.0	$142.33	$1,287.00	$220.00	7.50
CR 116	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.48	862	0.0	$142.33	$1,287.00	$220.00	7.50
Gym/Auditorium/Cafeteria	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	114	1,032	Relamp	No	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,032	0.55	997	0.0	$164.68	$1,427.00	$300.00	6.84
Gym/Auditorium/Cafeteria	1	Exit Signs: Fluorescent	None	12	8,760	None	No	1	Exit Signs: Fluorescent	None	12	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gym/Auditorium/Cafeteria	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.06	168	0.0	$27.73	$175.50	$30.00	5.25
Kitchen	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
Kitchen 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.04	112	0.0	$18.48	$117.00	$20.00	5.25
Stage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.11	283	0.0	$46.71	$350.00	$60.00	6.21
Stage	48	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	48	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Behind Staircase A (Corridor)	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,032	0.14	353	0.0	$58.39	$492.50	$50.00	7.58
Behind Staircase A (Corridor)	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Custodial Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
Girls RR	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	31	1,474	0.02	53	0.0	$8.68	$150.00	$0.00	17.28
Boys RR	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	31	1,474	0.02	53	0.0	$8.68	$150.00	$0.00	17.28
Office 1A	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,474	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,474	0.01	27	0.0	$4.48	$48.20	$10.00	8.52
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.04	112	0.0	$18.48	$117.00	$20.00	5.25
Storage	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement_Boiler Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.17	448	0.0	$73.94	$468.00	$80.00	5.25
Basement_Storage Space	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,474	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,474	0.03	89	0.0	$14.70	$107.70	$15.00	6.30
Basement_Basement stairs	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement_Basement stairs	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,474	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,474	0.01	30	0.0	$4.90	$35.90	$5.00	6.30
Basement_Meter room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.02	56	0.0	$9.24	$58.50	$10.00	5.25
Basement_Book Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.02	56	0.0	$9.24	$58.50	$10.00	5.25

	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
Basement_CR 104	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.52	940	0.0	$155.27	$1,404.00	$240.00	7.50
Basement_CR 105	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.52	940	0.0	$155.27	$1,404.00	$240.00	7.50
Basement_CR 106	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.52	940	0.0	$155.27	$1,404.00	$240.00	7.50
Basement_CR 107	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.52	940	0.0	$155.27	$1,404.00	$240.00	7.50
Basement_CR 109	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.35	627	0.0	$103.51	$936.00	$160.00	7.50
Basement_CR 110	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.35	627	0.0	$103.51	$936.00	$160.00	7.50
Basement_CR 111	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.35	627	0.0	$103.51	$936.00	$160.00	7.50
Basement_Rm 112 Computer Lab	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.35	627	0.0	$103.51	$936.00	$160.00	7.50
Basement_Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.06	117	0.0	$19.41	$175.50	$30.00	7.50
Basement_Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.06	117	0.0	$19.41	$175.50	$30.00	7.50
Basement_Boys Locker Rm	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.11	196	0.0	$32.35	$292.50	$50.00	7.50
Basement_Girls Locker Rm	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.11	196	0.0	$32.35	$292.50	$50.00	7.50
Basement_Gym	19	LED - Linear Tubes: (4) 5' Lamps	Wall Switch	80	1,474	None	Yes	19	LED - Linear Tubes: (4) 5' Lamps	Occupancy Sensor	80	1,032	0.30	773	0.0	$127.71	$1,080.00	$140.00	7.36
Basement_Gym	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.02	39	0.0	$6.47	$58.50	$10.00	7.50
Basement_Gym	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement_Girls PE Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.09	157	0.0	$25.88	$234.00	$40.00	7.50
Basement_Gym Girls Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.06	117	0.0	$19.41	$175.50	$30.00	7.50
Basement_Gym Mec. Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,032	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,032	0.06	117	0.0	$19.41	$150.40	$30.00	6.20
Basement_Office in Gym	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.09	157	0.0	$25.88	$234.00	$40.00	7.50
Basement_Boys Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,032	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,032	0.06	117	0.0	$19.41	$175.50	$30.00	7.50
Basement_Boys Storage-Server Rm	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,474	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,032	0.08	212	0.0	$35.04	$266.40	$50.00	6.18
Basement_New Section Hallway	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
Basement_New Section Hallway	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,032	0.57	1,485	0.0	$245.25	$2,028.50	$210.00	7.41
Basement_1st Flr Old Section Hallway	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
Basement_1st Flr Old Section Hallway	11	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,474	Relamp	Yes	11	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,032	0.16	407	0.0	$67.31	$794.90	$55.00	10.99

	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
Basement_1st Flr Old Section Hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,032	0.49	1,273	0.0	$210.22	$1,653.00	$180.00	7.01
Basement_Exit #3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.02	56	0.0	$9.24	$58.50	$10.00	5.25
Basement_Exit #1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.02	56	0.0	$9.24	$58.50	$10.00	5.25
Basement_Exit #4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.02	56	0.0	$9.24	$58.50	$10.00	5.25
Basement_Exit #4	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement_Exit #8	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement_Exit #8	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,474	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,474	0.02	56	0.0	$9.24	$58.50	$10.00	5.25
Exterior LED_recessed 2x2	4	LED - Fixtures: Ambient 2x2 Fixture	Daylight Dimming	40	4,380	None	No	4	LED - Fixtures: Ambient 2x2 Fixture	Daylight Dimming	40	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior LED_Wallpack	11	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	50	4,380	None	No	11	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	50	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior LED_Doorlight	6	LED Screw-In Lamps: Outdoor Porch Wall Mount	Daylight Dimming	15	4,380	None	No	6	LED Screw-In Lamps: Outdoor Porch Wall Mount	Daylight Dimming	15	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior LED_Flood	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	30	4,380	None	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	30	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior__HPS Wallpack	2	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	4,380	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	48	4,380	0.19	1,436	0.0	$237.15	$781.35	$200.00	2.45
Exterior__Decorative CFL	2	Compact Fluorescent: Decorative	Daylight Dimming	13	4,380	None	No	2	Compact Fluorescent: Decorative	Daylight Dimming	13	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior__LED Large	2	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	Daylight Dimming	50	4,380	None	No	2	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	Daylight Dimming	50	4,380	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
Roof	Restrooms	4	Exhaust Fan	0.3	80.0%	No	1,050	No	80.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Kitchen	1	Exhaust Fan	1.0	80.0%	No	1,050	No	80.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Unit Ventilators	20	Ventilation Fan	0.3	80.0%	No	1,050	No	80.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boiler	2	Boiler Feed Water Pump	0.5	80.0%	No	1,050	No	80.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boiler	2	Combustion Air Fan	0.5	80.0%	No	1,050	No	80.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	HHW Dist.	2	Heating Hot Water Pump	5.0	88.5%	No	1,050	No	88.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	HHW Dist.	2	Heating Hot Water Pump	0.8	80.0%	No	1,050	No	80.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Furnace Fan (RTU1,2)	Gym Area	2	Supply Fan	5.0	89.5%	Yes	1,050	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Furnace Fan (RTU3)	Gym Area	1	Supply Fan	0.8	89.5%	Yes	1,050	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Gym Area	2	Ventilation Fan	1.0	89.5%	No	1,050	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Server Room, copy room	1	Ventilation Fan	0.5	89.5%	No	1,050	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Windows	Offices	20	Window AC	0.60		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Teachers Lounge (CU-1)	1	Split-System Air-Source HP	1.50	20.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Locker Rooms (CU-6)	1	Split-System Air-Source HP	3.17	42.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Gym Area (RTU1,2)	2	Packaged AC	17.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Gym Area (RTU3)	1	Packaged AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classrooms (CU-2)	1	Split-System Air-Source HP	3.00	40.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classrooms(CU-3)	1	Split-System Air-Source HP	3.00	40.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classrooms(CU-4)	1	Split-System Air-Source HP	3.00	40.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classrooms(CU-5)	1	Split-System Air-Source HP	2.50	32.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classrooms	1	Split-System Air-Source HP	2.50	32.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Locker Rooms(CU-7)	1	Split-System Air-Source HP	3.17	42.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	4 classrooms	1	Split-System Air-Source HP	12.00	160.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Side of Bldg	Classrooms(CU-8)	1	Split-System Air-Source HP	3.00	40.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Side of Bldg	Classrooms(CU-10)	1	Split-System Air-Source HP	1.50	20.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Side of Bldg	Classrooms(CU-9)	1	Split-System Air-Source HP	3.17	42.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Side of Bldg	Classrooms(CU-11)	1	Split-System Air-Source HP	3.17	42.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Part Bldb	2	Induced Draft Steam Boiler	2,904.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
RTU1,2	Gym Area	2	Furnace	284.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
RTU3	Gym Area	1	Furnace	64.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

DHW Inventory & Recommendations

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

Reach-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions					Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Energy Efficient Doors?	Install Door Heater Control?	Install Aluminum Night Covers?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Medium Temp Freezer (0F to 30F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Medium Temp Freezer (0F to 30F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Low Temp Freezer (-35F to -5F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	2	Low Temp Freezer (-35F to -5F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Insulated Food Holding Cabinet (3/4 Size)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Gas Griddle (4 Feet Width)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Electric Steamer	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Gas Combination Oven/Steam Cooker (15 - 28 Pans)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
various	20	Projector	300.0	
various	24	Smartboard	200.0	
various	23	Laptops	150.0	
various	2	Photocopier	500.0	
various	2	Refrigerator	200.0	
various	4	microwave	1,000.0	
various	56	desktop PC	300.0	
various	9	desktop printer	50.0	
various	2	Tube TV	400.0	
CR 114	1	Washer	500.0	
CR 114	1	Dryer	700.0	
CR 114	1	Electric Stove	2,000.0	
CR 114	1	Refridgerator	500.0	
CR 114	1	Dishwasher	1,000.0	

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

George Washington Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 45,080
Built: 1931

For Year Ending: July 31, 2017
Date Generated: April 09, 2018

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
George Washington Elementary School 1530 Leslie Street Hillside, New Jersey 07205	Hillside Board of Education 195 Virginia Street Hillside, NJ 07205 908-352-7664	Darice Gonzalez 195 Virginia Street Hillside, NJ 07205 908-352-7664 ext 6429 dgonzalez@hillsidek12.org

Property ID: 6288473

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
66 kBtu/ft²

Source EUI
109 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,122,124 (71%)
Electric - Grid (kBtu)	855,009 (29%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	73.4
National Median Source EUI (kBtu/ft²)	121.1
% Diff from National Median Source EUI	-10%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	208

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)