Local Government Energy Audit:
Energy Audit Report

Herma Simmons Elementary School
Clayton Public Schools
300 West Chestnut Street
Clayton, NJ 08312

September 5, 2017

Report by:
TRC Energy Services

Disclaimer

The intent of this energy analysis report is to identify energy savings opportunities associated with recommended upgrades to the facility's systems at this site. Approximate savings are included in this report to make decisions about reducing energy use at the facility. This report, however, is not intended to serve as a detailed engineering design document. It should be noted that detailed design efforts are required in order to implement several of the improvements evaluated as part of this energy analysis.

The energy conservation measures and estimates of energy consumption contained in this report have been reviewed for technical accuracy. However, all estimates contained herein of energy consumption at the site are not guaranteed, because energy consumption ultimately depends on behavioral factors, the weather, and many other uncontrollable variables. The energy assessor and New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy consumption vary from the estimated consumption shown herein.

Estimated installation costs are based on a variety of sources, including our own experience at similar facilities, our own pricing research using local contractors and vendors, and cost estimating handbooks such as those provided by RS Means. The cost estimates represent our best judgment for the proposed action. The Owner 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 a particular installation, and for conditions which cannot be known prior to in-depth investigation and design, the energy assessor does not guarantee installed cost estimates and shall in no event be liable should actual installed costs vary from the estimated costs herein.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates and are based on program information available at the time this report is written. The NJBPU reserves the right to extend, modify, or terminate programs without prior or further notice, including incentive levels and eligibility requirements. The Owner should review available program incentives and requirements prior to selecting and/or installing any recommended measures.

Table of Contents

Table of Figures

1 EXECUTIVE SUMMARY

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

The goal of a LGEA is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and put you in a position to implement the ECMs. The LGEA also sets you on the path to receive financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing the ECMs.

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey local government in controlling energy costs and protecting our environment by offering a full spectrum of energy management options.

1.1 Facility Summary

Clayton Public Schools form a comprehensive community public school district that serves students in pre-kindergarten through twelfth (12th) grade from the Township of Clayton, Gloucester County, New Jersey. Herma Simmons Elementary School consists of three school programs. One preschool, one kindergarten and one elementary School (grades 1-5) all located in one building.

Herma Simmons Elementary School is an 82,000 square foot facility built in 1988. The building is a single floor and includes classrooms, offices, a gymnasium, an auditorium, a cafeteria, a library, a kitchen, a maintenance shop and storage. The building's foundation consists of concrete perimeter foundation. Exterior walls are finished with brick masonry and a concrete modular wall system. Portions of exterior walls are accented with concrete block. The building has a flat roof covered with a white membrane that is in good condition and can contribute in cooling saving by reflecting heat. There are several solar panels installed on the roof. Windows are a combination of fixed pane windows and small operable windows for ventilation. The windows are double pane with slightly tinted glass that are in good condition and show no signs of outside air infiltration. Exterior doors are constructed of metal and in good condition. The Clayton Board of Education installed a 200 kW solar energy project on the roof in 2010. The school also has a 150 kW synchronous alternating current (AC) backup generator.

Interior lighting consists of T8 and T12 fluorescent lamps and fixtures with both electronic and magnetic ballasts, as well as incandescent and halogen incandescent. Lighting control is provided by manual wall switches. Exit signs throughout the facility are mixed, incandescent and LED fixtures. Exterior lighting consists of high intensity discharge (HID) and compact fluorescents and are controlled with photocells.

The HVAC system consists of two (2) Aerco condensing gas-fired boilers, one air-cooled screw chiller and 19 roof top units (RTUs) ranging from 3 to 25 tons. They are controlled by a building energy management system located in the boiler room. Portions of the classrooms have unit ventilators that are equipped with hot water coils for space heating and DX coils for cooling and dehumidification.

A thorough description of the facility and our observations are located in Section 2, "Facility Description and Existing Conditions".

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated nine (9) projects which represent opportunities for Herma Simmons Elementary School to reduce annual energy costs by roughly $46,139 and annual greenhouse gas emissions by 399,612 lbs CO_2e. The measures would pay for themselves in roughly 3.08 years. The breakdown of existing and potential utility costs is illustrated in Figure 1 and Figure 2, below. These projects represent an opportunity to reduce Herma Simmons Elementary School's annual energy use by 27%.

Figure 1 – Previous 12 Month Utility Costs

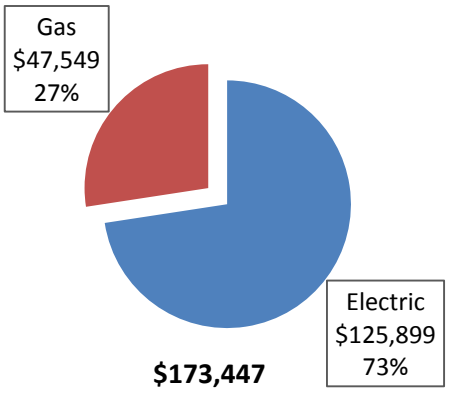
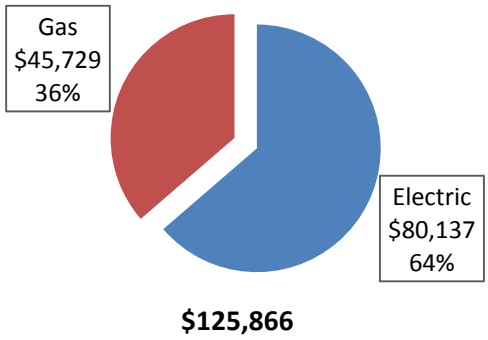


Figure 2 – Potential Post-Implementation Costs



A detailed description of Herma Simmons Elementary School's existing energy use is located in Section 3, "Site Energy Use and Costs".

The evaluated measures have been listed and grouped into major categories as shown in Figure 3. Brief descriptions of the categories can be found below and descriptions of the individual opportunities can be found in Section 4, "Energy Conservation Measures". Measures without an "ECM #" in the table below have been evaluated, but are not recommended for implementation.

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			298,815	78.9	0.0	$37,768.74	$140,483.52	$11,025.00	$129,458.52	3.43	300,904
ECM 1	Install LED Fixtures	Yes	88,128	25.7	0.0	$11,138.98	$56,454.10	$8,065.00	$48,389.10	4.34	88,744
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	184,385	46.7	0.0	$23,305.40	$65,105.39	$0.00	$65,105.39	2.79	185,674
ECM 3	Retrofit Fixtures with LED Lamps	Yes	23,400	6.3	0.0	$2,957.65	$15,052.05	$2,960.00	$12,092.05	4.09	23,564
ECM 4	Install LED Exit Signs	Yes	2,901	0.2	0.0	$366.71	$3,871.98	$0.00	$3,871.98	10.56	2,922
Lighting Control Measures			25,579	6.5	0.0	$3,233.06	$10,556.00	$1,820.00	$8,736.00	2.70	25,758
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	25,579	6.5	0.0	$3,233.06	$10,556.00	$1,820.00	$8,736.00	2.70	25,758
Domestic Water Heating Upgrade			24,258	2.7	397.3	$4,885.16	$1,886.79	$50.00	$1,836.79	0.38	70,946
ECM 6	Install High Efficiency Gas Water Heater	Yes	15,240	2.7	-52.0	$1,688.21	$1,406.40	$50.00	$1,356.40	0.80	9,258
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	9,018	0.0	449.3	$3,196.95	$480.39	$0.00	$480.39	0.15	61,687
Food Service Equipment & Refrigeration Measures			379	0.0	0.0	$47.84	$1,248.00	$75.00	$1,173.00	24.52	381
ECM 8	Replace Refrigeration Equipment	Yes	379	0.0	0.0	$47.84	$1,248.00	$75.00	$1,173.00	24.52	381
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	$203.73	$718.80	$0.00	$718.80	3.53	1,623
ECM 9	Vending Machine Control	Yes	1,612	0.0	0.0	$203.73	$718.80	$0.00	$718.80	3.53	1,623
TOTALS			350,642	88.1	397.3	$46,138.53	$154,893.11	$12,970.00	$141,923.11	3.08	399,612

* - 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 measure 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 conditions allow. Automated control reduces reliance on occupant behavior for adjusting lights. These measures save energy by reducing the amount of time lights are on.

Domestic Water Heating upgrade measures generally involve replacing old inefficient domestic water heating systems with modern energy efficient systems. New domestic water heating systems can provide equivalent or greater capacity as older systems, but use less energy. These measures save energy by reducing the fuel used by the domestic water heating systems due to improved efficiency or the removal of standby losses.

Food Service Equipment & Refrigeration measures generally involve improvements in the efficiency of cooking, dish washing, and food storage equipment. These measures could encompass more efficient convection ovens, steamers, ice machines, or refrigeration. These measures save energy by reducing the fuel used due to improved efficiency.

Plug Load Equipment control measures generally involve installing automation that limits the power use or operation of equipment plugged into an electrical receptacle based on occupancy.

Energy Efficient Practices

TRC also identified 21 no/low cost energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral and operational adjustments as well as performing routine maintenance on building systems. Through these practices equipment lifetime can be extended; occupant comfort, health and safety can be improved; and annual energy, operation, and maintenance costs can be reduced. Opportunities identified at Clayton Public Schools include:

- Reduce Air Leakage
- Close Doors and Windows
- Use Window Treatments/Coverings

- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Turn Off Unneeded Motors
- Perform Routine Motor Maintenance
- Use Fans to Reduce Cooling Load
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Ensure Economizers are Functioning Properly
- Assess Chillers & Request Tune-Ups
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Check for and Seal Duct Leakage
- Perform Proper Boiler Maintenance
- Perform Proper Furnace Maintenance
- Perform Proper Water Heater Maintenance
- Perform Maintenance on Compressed Air Systems
- Replace Computer Monitors
- Water Conservation

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

Self-Generation Measures

TRC evaluated the potential for installing self-generation sources for Herma Simmons Elementary School. Based on the configuration of the site and its loads there is a low potential for installing any additional PV or combined heat and power self-generation measures.

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

1.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, the equipment changes outlined for each ECM need to be selected and installed through project implementation. One of the first considerations is if there is capital available for project implementation. Another consideration is whether to pursue individual ECMs, a group of ECMs, or a comprehensive approach wherein all ECMs are pursued, potentially in conjunction with other facility projects or improvements.

Rebates, incentives, and financing are available from the NJBPU, NJCEP, as well as some of the state's investor-owned utilities, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any project, please review the appropriate incentive program guidelines before proceeding. You will need to submit an application for the incentives before purchasing materials and beginning installation.

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

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

For facilities with capital available for implementation of selected individual measures or phasing 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 design the ECM(s), select the equipment and apply for the incentive(s). Program pre-approval is required for some SmartStart incentives after receiving approval may the ECM(s) be installed. The incentive values listed above in Figure 3 represent the SmartStart program and will be explained further in Section 7, as well as the other programs as mentioned below.

For facilities with capital available and an interest in a comprehensive, holistic approach to energy conservation should consider participating in the P4P EB program. This program has minimum savings requirements and the incentives are based on actual measured performance savings. The application process is more involved, and requires working with an eligible contractor, but may result in more lucrative incentives up to 50% of total project cost.

For facilities without capital available 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 external project development, design, and implementation services as well as financing for implementing ECMs. This LGEA report is the first step for participating in ESIP and should help you determine next steps. Refer to Section 7.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a program (non-NJCEP) designed to reduce consumer electric load when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak 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 locally. By enabling grid operators to call upon Curtailment Service Providers and energy consumers 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 will receive payments whether or not their facility is called upon to curtail their load. Refer to Section **Error! Reference source not found.** for additional information on this program.

Additional descriptions of all relevant incentive programs are located in Section 7. You may also check the following website for further information on available rebates and incentives:www.njcleanenergy.com/ci

To ensure projects are implemented such that maximum savings and incentives are achieved, bids and specifications should be reviewed by your procurement personnel and/or consultant(s) to ensure that selected equipment coincides with LGEA recommendations, as well as applicable incentive program guidelines and requirements.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 4 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Fran Adler	Business Administrator	fadler@claytonps.org	(856) 881-8700 Ext. 3056
Designated Representative			
Bill Latona	Maintenance Personnel		(856) 881-8704
TRC Energy Services			
Moussa Traore	Auditor	mtraore@trcsolutions.com	(732) 855-2879

2.2 General Site Information

On October 11, 2016, TRC performed an energy audit at Herma Simmons Elementary School located in Clayton, NJ. TRC's Auditor met with Bill Latona from Maintenance Personnel to review the facility operations and focus the investigation on specific energy-using systems.

Clayton Public Schools form a comprehensive community public school district that serves students in pre-kindergarten through twelfth (12th) grade from the Township of Clayton, located in Gloucester County, New Jersey. Herma Simmons Elementary School consists of three school programs. One preschool, one kindergarten and one elementary school (grades 1-5) all located in one building.

Herma Simmons Elementary School is an 82,000 square foot facility built in 1988 with a concrete perimeter foundation. The building is a single floor and includes classrooms, offices, a gymnasium, an auditorium, a cafeteria, a library, a kitchen, a maintenance shop and storages. Exterior walls are finished with brick masonry and concrete modular wall system. Portions of exterior walls are accented with concrete block. The building has a flat roof covered with a white membrane that is in good condition and can contribute in cooling saving by reflecting heat. There are several solar panels installed on the roof. The windows throughout the facility are a combination of fixed pane windows and small operable windows for ventilation. The windows are double pane with slightly tinted glass that are in good condition and show no signs of outside air infiltration. Exterior doors are constructed of metal and in good condition. The Clayton Board of Education installed a 200 kW solar energy project in 2010. The project included photovoltaic (PV) arrays on the roof. Also the school has a 150 kW synchronous alternating current (AC) backup generator located rear building.

The facility interior lighting system consists of T8 and T12 fluorescent lamps and fixtures with both electronic and magnetic ballasts, as well as incandescent and halogen incandescent. Lighting control is provided by manual wall switch. Exit signs throughout the facility are mixed, incandescent and LED fixtures. The facility has exterior lighting which consists of high intensity discharge (HID) and compact fluorescent and are controlled with photocells.

The facility's HVAC system consists of two (2) Aerco condensing gas-fired boilers, one air-cooled screw chiller and 19 roof top units (RTUs) ranging from 3 to 25 tons. They are controlled by a building energy management system located in the boiler room. Portions of the classrooms have unit ventilators that are equipped with hot water coils for space heating and DX coils for cooling and dehumidification.

2.3 Building Occupancy

The school building is open Monday through Saturday. The typical schedule is presented in the table below

Figure 5 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Herma Simmons Elementary School	Weekday	7:30 AM - 4:30 PM
Herma Simmons Elementary School	Weekend	8:30 AM - 1:30 PM

2.4 Building Envelope

The building's foundation consists of concrete perimeter foundation. Exterior walls are finished with brick masonry and concrete modular wall systems. Portions of exterior walls are accented with concrete block. The building has a flat roof covered with a white membrane that is in good condition and can contribute in cooling saving by reflecting heat. The windows throughout the facility are a combination of fixed pane windows and small operable windows for ventilation. The windows are double pane with slightly tinted glass that are in good condition and show no signs of outside air infiltration. Exterior doors are constructed of metal and are in good condition. The building envelope is in good condition.

2.5 On-site Generation

The Clayton Board of Education installed a 200 kW solar energy project in 2010. The project included photovoltaic (PV) arrays on the roof. The school also has a 150 kW synchronous alternating current (AC) backup generator located at the rear of the building.

2.6 Energy-Using Systems

Please refer to Appendix A: Equipment Inventory & Recommendations for an inventory of your equipment.

Lighting System

Interior lighting at the facility is provided by linear fluorescent T8 and T12 lamps with electronic and magnetic ballasts. Most of the building spaces use 2, 3, and 4lamp, 4-foot long troffers with diffusers. The hallways are lit with linear T8 lamps fixtures. The classrooms, library, offices, cafeteria, kitchen, and bathrooms are lit with T12 lamp fixtures. The auditorium and stage are lit with incandescent and halogen incandescent lamps. The gymnasium is lit with T5 lamps fixtures. Classrooms 120, 121, and 122 have lighting control provided by occupancy sensors. Lighting control in the remaining space consists of manual light switches. The facility perimeter and parking lot lighting consists of HID and halogen incandescent and are controlled with photocells.

Significant energy saving could be achieved by replacing the existing lighting systems with LED linear tubes and LED lamp fixtures. Installing occupancy sensors in select areas will yield additional energy savings.

Chilled Water and Condenser Water System

The facility is served by a single 164-ton Carrier, air-cooled screw chiller. The chiller is running with variable speeds. The chiller is supplied two 15 hp pumps. Chilled water is distributed to the facility at 42ºF based on a reset schedule when the outside air temperature is above 60°F. The setpoint is reset to 50°F when the outside air is below 55°F. The chiller plant is locked out when the outside air temperature is below 45°F. The chiller plant has been well maintained.

Hot Water / Steam System

The hot water system consists of two (2) Aerco 2,000 kBtu/hr output, condensing hot water boilers. The boilers have a nominal combustion efficiency of 95%. Hot water is supplied at 180°F when the outside air temperature is below 50°F and the setpoint is reset to 155°F when the outside air is above 65°F. The boilers provide hot water to air handlers and the classroom unit ventilators that are equipped with hot

water coils for space heating and DX coils for cooling and dehumidification. The boilers operate in a lead/lag configuration. Both boilers may be required during cold weather. They are controlled by the building energy management system located in the boiler room. The boilers are in good condition and well maintained.

Air Conditioning Systems (CHW)

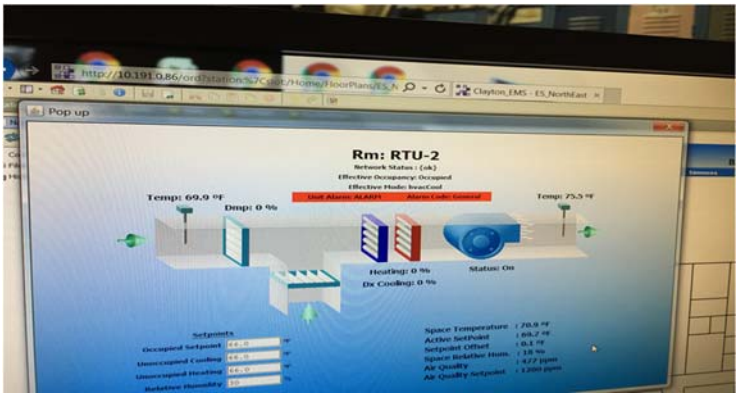
There is one air handling unit that serves the gymnasium. We were unable access to the air handler during the field audit as it is suspended between the floor and the ceiling. As a result we cannot describe its actual condition.

Air Conditioning (DX)

There are a total of 19 roof top units (RTUs) that serve the facility. The copy room and the main office have 3 and 2 ton Carrier split air conditioning system respectively. Classrooms 120, 121, 122 are served by a 10 ton Mitsubishi split AC system. The kindergarten classrooms 191, 192, 193, 194, and 195 are each served by a 4 ton Rheem packaged AC. Classrooms 216, 218, and IT room are each served by a 2.5 ton Friedrich split AC system. The library, cafeteria, and auditorium are served by 10 ton, 20 ton, and 12.5 ton Carrier Packaged AC, respectively. The units utilize a scroll compressor and a direct-expansion (DX) coil. The remaining classrooms have unit ventilators that are equipped with hot water coils for space heating and DX coils for cooling and dehumidification. The units are controlled with a building energy management system located in the boiler room.

Building Energy Management System

The facility has a building energy management system (BMS). It is a computerized HVAC controller that operates the direct digital control (DDC) system.



Domestic Hot Water

The domestic hot water system for the facility consists of two A. O. Smith gas fired condensing hot water heaters with an input rating of 200 kBtu/hr each and a nominal efficiency of 97%.

Each water heater has a 100 gallon storage tank. Two (2) 500 W recirculation pumps distribute 120°F water to the entire site except the kindergarten in the north wing which has one 20 gallon State Industries electric non-condensing hot water heater. We recommend the replacement of this electric water heater with a gas fired water heater. The water heaters are located in the boiler room and in the kindergarten custodial closet.

Food Service & Laundry Equipment

The school has an electric and gas fired kitchen that is used to prepare approximately 400 lunches per day for the students. The ovens, range tops and griddle are all gas fired

Refrigeration

The facility has two (2) cold storage areas: a walk-in cooler area and a walk-in freezer area. The cooler area is maintained at a constant temperature of 38°F and freezer area is maintained at a constant 6°F. The cooler area is served by four evaporators and the freezer area is served by two evaporators each having a single 1/2 hp fan. There are two 5 hp condensing units with reciprocating compressors connected to evaporators serving the cooler section and there is one 5 hp condensing unit connected to evaporators serving the freezer area. The kitchen also has a free standing commercial size freezer.

Plug Load & Vending Machines

There are 182 computer work stations throughout the facility, roughly 99% of which are desktop units with LCD monitors. There is one server room in the facility (IT room) and cooling is provided by a dedicated 2.5-ton Friedrich split system. The facility has one refrigerated beverage vending machine located in the teacher's lunch room.

2.7 Water-Using Systems

There are 15 restrooms at this facility. A sampling of restrooms found that faucets are rated for 2.5 gpm, the toilets are rated at 2.2 gallons per flush and the urinals are rated at 2 gallons per flush. The kitchen has faucets that are rated for 3.5 gpm. The restrooms are clean and well maintained.

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/ft^2 and energy use/ft^2. These energy use indices are indicative of the relative energy effectiveness of this building. There are a number of factors that could cause the energy use of this building to vary from the "typical" energy use for other facilities identified as: School (K-12). Specific local climate conditions, daily occupancy hours of the facility, seasonal fluctuations in occupancy, daily operating hours of energy use systems, and the behavior of the occupants with regard to operating systems that impact energy use such as turning off appliances and leaving windows open. Please refer to the Benchmarking section within Section 3.4 for additional information.

3.1 Total Cost of Energy

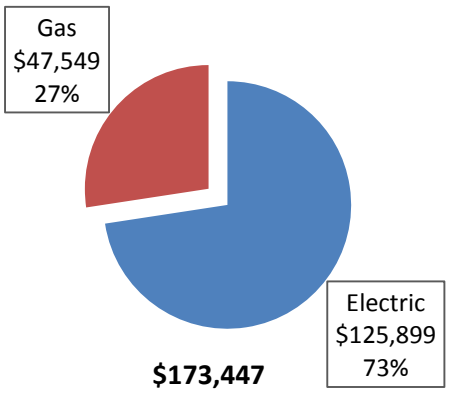
The following energy consumption and cost data is based on the last 12 month period of utility usage data that was provided for each utility. The annual consumption and cost was developed from this information.

Figure 6 - Utility Summary

Utility Summary for Herma Simmons Elementary School		
Fuel	Usage	Cost
Electricity	983,534 kWh	$125,899
Natural Gas	103,848 Therms	$47,549
Total		$173,447

The current utility cost for this site is $173,447 as shown in the chart below.

Figure 7 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by Atlantic City Electric. The average electric cost (combined for commodity, transmission and distribution) for the past 12 months is $0.126/kWh, which is the blended rate used throughout the analyses in this report. The monthly electricity consumption and peak demand is represented graphically in the chart below.

Figure 8 - Graph of 12 Months Electric Usage & Demand

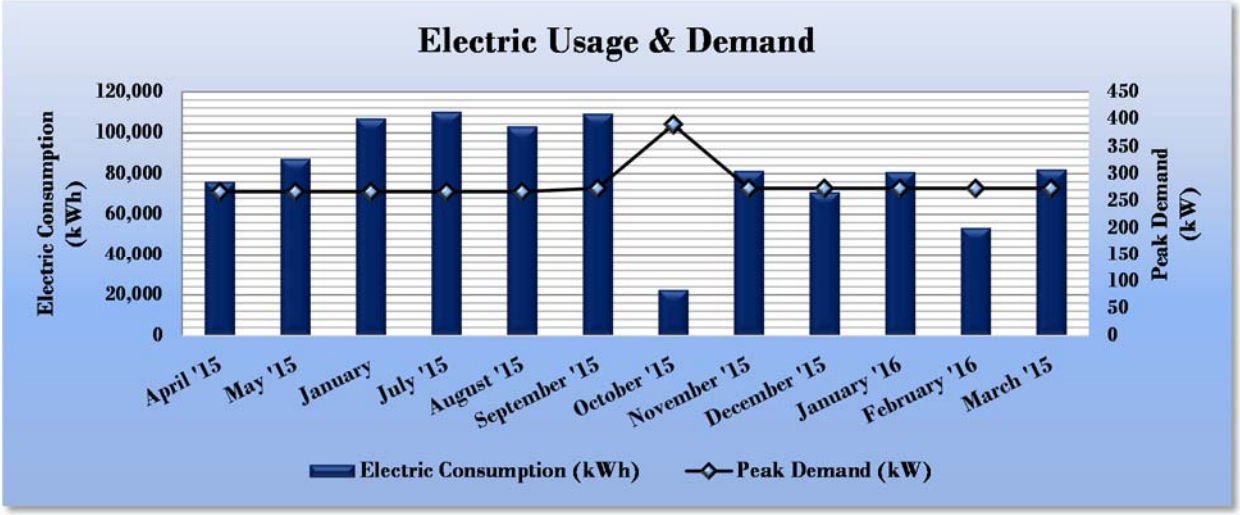


Figure 9 - Table of 12 Months Electric Usage & Demand

Electric Billing Data for Herma Simmons Elementary School						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/30/15	30	76,041	267	$136	$7,073	No
5/31/15	31	87,307	267	$127	$7,728	No
6/31/15	30	106,850	267	$136	$14,421	No
7/31/15	31	110,092	267	$149	$9,014	No
8/31/15	31	102,938	267	$127	$13,752	No
9/30/15	30	109,169	273	$136	$14,907	No
10/31/15	31	22,490	390	$123	$5,407	No
11/30/15	31	81,368	273	$123	$11,442	No
12/31/15	31	70,960	273	$136	$10,484	No
1/31/16	30	80,838	273	$140	$11,684	No
2/29/16	29	53,400	273	$127	$8,355	No
3/31/15	30	82,082	273	$127	$11,632	No
Totals	365	983,534	390	$1,585	$125,899	0
Annual	365	983,534	390	$1,585	$125,899	

3.3 Natural Gas Usage

Natural Gas is provided by South Jersey Gas. The average gas cost for the past 12 months is $0.458/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is represented in the chart and table below.

Figure 10 - Chart of 12 Months Natural Gas Usage

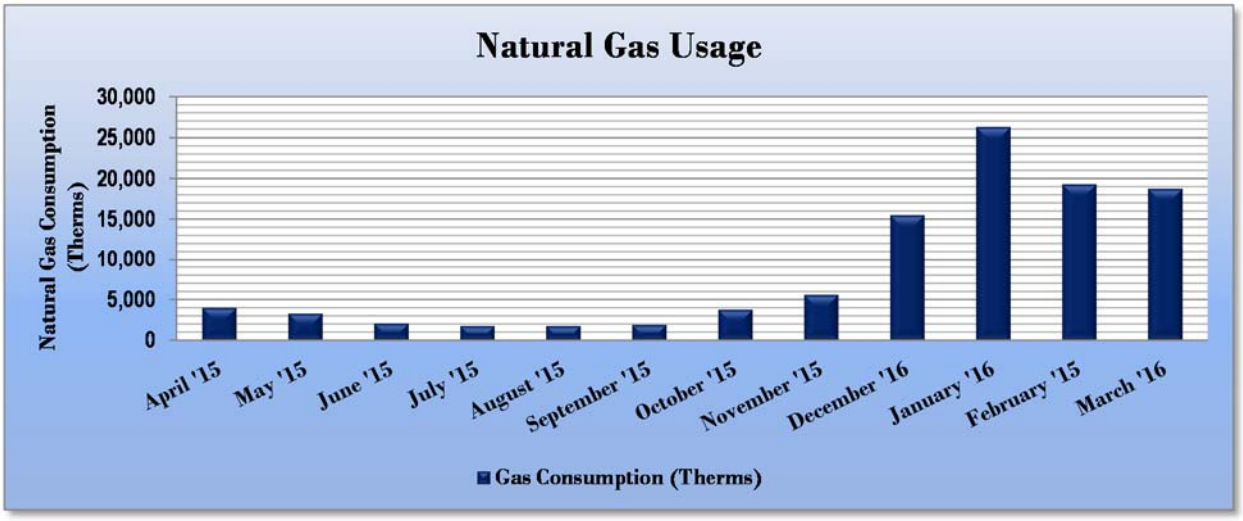


Figure 11 - Table of 12 Months Natural Gas Usage

Gas Billing Data for Herma Simmons Elementary School				
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost	TRC Estimated Usage?
4/17/15	30	4,000	$2,307	No
5/16/15	31	3,281	$1,927	No
6/16/15	30	2,063	$936	No
7/20/15	31	1,733	$797	No
8/18/15	31	1,752	$829	No
9/18/15	30	1,894	$887	No
10/16/15	31	3,744	$1,697	No
11/16/15	31	5,594	$2,335	No
12/17/16	31	15,500	$6,976	No
1/18/16	30	26,248	$11,875	No
2/16/15	29	19,294	$8,550	No
3/16/16	30	18,745	$8,432	No
Totals	365	103,848	$47,549	0
Annual	365	103,848	$47,549	

3.4 Benchmarking

This facility was benchmarked through 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 compares its performance against a yearly baseline, national medians, or similar buildings in your portfolio. Metrics used in this comparison are the energy use intensity (EUI) and ENERGY STAR® Score.

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 energy than similar buildings on a square foot basis or if that building performs better than the median. EUI is presented in both 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 is the raw fuel consumed to generate the energy consumed at the site, factoring in energy production and distribution losses.

Figure 12 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Clayton Public Schools	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	261.5	141.4
Site Energy Use Intensity (kBtu/ft^2)	167.6	58.2

By implementing all recommended measures covered in this reporting, the Project's estimated post-implementation EUI improves as shown in the Table below:

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

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Clayton Public Schools	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	210.6	141.4
Site Energy Use Intensity (kBtu/ft^2)	148.1	58.2

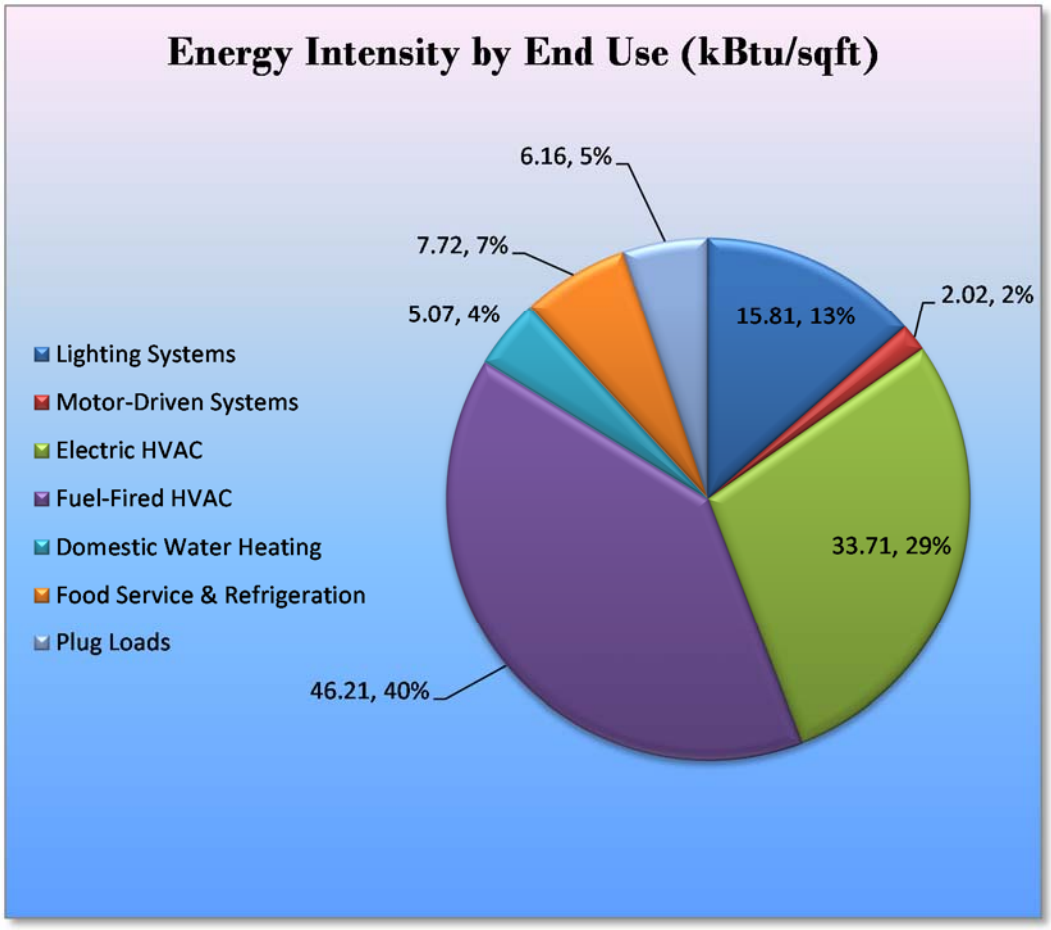
Many buildings can also receive a 1 – 100 ENERGY STAR® score. This score compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide — and may be eligible for ENERGY STAR® certification. This facility has a current score of 24.

The Portfolio Manager, Statement of Energy Performance can be found in Appendix B: ENERGY STAR® Statement of Energy Performance.

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 and determine their proportional contribution to overall building energy usage. This visual representation of energy end uses highlights systems that may benefit most from energy efficiency projects.

Figure 14 - Energy Balance (% and kBtu/SF)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy projects, help prioritize specific measures for implementation, and set Clayton Public Schools on the path to receive financial incentives. 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 considered sufficient to make "Go/No-Go" decisions and to prioritize energy projects. Savings are based on the New Jersey Board of Public Utilities New Jersey Clean Energy Program Protocols to Measure Resource Savings dated March 17, 2014. Further analysis or investigation may be required to calculate more accurate savings to support any custom SmartStart, or the Pay for Performance incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJ prescriptive SmartStart program. Depending on your implementation strategy, the project may be eligible for more lucrative incentives through other programs as identified in Section 7.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 15 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		298,815	78.9	0.0	$37,768.74	$140,483.52	$11,025.00	$129,458.52	3.43	300,904
ECM 1	Install LED Fixtures	88,128	25.7	0.0	$11,138.98	$56,454.10	$8,065.00	$48,389.10	4.34	88,744
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	184,385	46.7	0.0	$23,305.40	$65,105.39	$0.00	$65,105.39	2.79	185,674
ECM 3	Retrofit Fixtures with LED Lamps	23,400	6.3	0.0	$2,957.65	$15,052.05	$2,960.00	$12,092.05	4.09	23,564
ECM 4	Install LED Exit Signs	2,901	0.2	0.0	$366.71	$3,871.98	$0.00	$3,871.98	10.56	2,922
Lighting Control Measures		25,579	6.5	0.0	$3,233.06	$10,556.00	$1,820.00	$8,736.00	2.70	25,758
ECM 5	Install Occupancy Sensor Lighting Controls	25,579	6.5	0.0	$3,233.06	$10,556.00	$1,820.00	$8,736.00	2.70	25,758
Domestic Water Heating Upgrade		24,258	2.7	397.3	$4,885.16	$1,886.79	$50.00	$1,836.79	0.38	70,946
ECM 6	Install High Efficiency Gas Water Heater	15,240	2.7	-52.0	$1,688.21	$1,406.40	$50.00	$1,356.40	0.80	9,258
ECM 7	Install Low-Flow Domestic Hot Water Devices	9,018	0.0	449.3	$3,196.95	$480.39	$0.00	$480.39	0.15	61,687
Food Service Equipment & Refrigeration Measures		379	0.0	0.0	$47.84	$1,248.00	$75.00	$1,173.00	24.52	381
ECM 8	Replace Refrigeration Equipment	379	0.0	0.0	$47.84	$1,248.00	$75.00	$1,173.00	24.52	381
Plug Load Equipment Control - Vending Machine		1,612	0.0	0.0	$203.73	$718.80	$0.00	$718.80	3.53	1,623
ECM 9	Vending Machine Control	1,612	0.0	0.0	$203.73	$718.80	$0.00	$718.80	3.53	1,623
TOTALS		350,642	88.1	397.3	$46,138.53	$154,893.11	$12,970.00	$141,923.11	3.08	399,612

* - 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

Lighting Upgrades include several "submeasures" as outlined in Figure 16 below.

Figure 16 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		298,815	78.9	0.0	$37,768.74	$140,483.52	$11,025.00	$129,458.52	3.43	300,904
ECM 1	Install LED Fixtures	88,128	25.7	0.0	$11,138.98	$56,454.10	$8,065.00	$48,389.10	4.34	88,744
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	184,385	46.7	0.0	$23,305.40	$65,105.39	$0.00	$65,105.39	2.79	185,674
ECM 3	Retrofit Fixtures with LED Lamps	23,400	6.3	0.0	$2,957.65	$15,052.05	$2,960.00	$12,092.05	4.09	23,564
ECM 4	Install LED Exit Signs	2,901	0.2	0.0	$366.71	$3,871.98	$0.00	$3,871.98	10.56	2,922

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	69,844	17.7	0.0	$8,827.99	$14,257.82	$1,115.00	$13,142.82	1.49	70,333
Exterior	18,284	8.0	0.0	$2,310.99	$42,196.28	$6,950.00	$35,246.28	15.25	18,412

Measure Description

This measure evaluates replacing existing fixtures containing fluorescent (excluding T12), HID, and incandescent lamps with new high performance LED light fixtures. This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output.

Maintenance savings are anticipated since LED sources have burn hours which are generally more than twice that of a fluorescent source and more than 10 times incandescent sources. Maintenance savings may be partially offset by the higher material costs associated with LED sources.

During planning and design for the installation of new fixtures, we recommend a holistic approach that considers both the technology of the lighting sources and how they are controlled.

Please refer to Appendix A: Equipment Inventory & Recommendations for a detailed list of the locations and light fixtures affected by this measure.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	184,385	46.7	0.0	$23,305.40	$65,105.39	$0.00	$65,105.39	2.79	185,674
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	0

Measure Description

This measure evaluates replacing linear fluorescent lamps, ballasts, and reflectors with LED tube lamps, reflectors, and drivers specifically designed for existing linear fluorescent fixtures. The retrofit uses the existing fixture housing but replaces the rest of the components with an efficient source and reflectors designed for LEDs. This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output and efficiently projects the light into the space.

Maintenance savings are anticipated since LED sources have burn hours which are more than twice that of a fluorescent source. Maintenance savings may be partially offset by the higher material costs associated with LED sources.

During retrofit planning and design, we recommend a holistic approach that considers both the technology of the lighting sources and how they are controlled.

Please refer to Appendix A: Equipment Inventory & Recommendations for a detailed list of the locations and light fixtures affected by this measure.

ECM 3: 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	23,400	6.3	0.0	$2,957.65	$15,052.05	$2,960.00	$12,092.05	4.09	23,564
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	0

Measure Description

This measure evaluates replacing linear fluorescent lamps with LED tube lamps and replacing incandescent and halogen screw-in/plug-in based lamps with LED lamps. Many LED tube lamps are direct replacements for existing fluorescent lamps and can be installed although there is a fluorescent fixture ballast in place. Other tube lamps require that fluorescent fixture ballasts be removed or replaced with LED drivers. Screw-in/plug-in LED lamps can be used as a direct replacement for most other screw-in/plug-

in lamps. This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output.

Maintenance savings are anticipated since LED sources have burn hours which are more than twice that of a fluorescent source and more than 10 times incandescent sources. LED lamps that use the existing fluorescent fixture ballast will be constrained by the remaining hours of the ballast. Maintenance savings may be partially offset by the higher material costs associated with LED sources.

During retrofit planning and design, we recommend a holistic approach that considers both the technology of the lighting sources and how they are controlled.

Please refer to Appendix A: Equipment Inventory & Recommendations for a detailed list of the locations and light fixtures affected by this measure.

ECM 4: Install LED Exit Signs

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	2,901	0.2	0.0	$366.71	$3,871.98	$0.00	$3,871.98	10.56	2,922
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	0

Measure Description

This measure evaluates replacing incandescent lighting in exit signs with LEDs. LED sources require virtually no maintenance and LED exit signs have a life expectancy of at least 20 years. Many manufacturers can provide retrofit kits that meet fire and safety code requirements. Retrofit kits are less expensive and simpler to install than replacement signs, however, new fixtures would have a longer useful life and are therefore recommended.

A reduction in maintenance costs will be realized with the proposed retrofit because lamps will not have to be replaced as frequently.

Please refer to Appendix A: Equipment Inventory & Recommendations for a detailed list of the locations and light fixtures affected by this measure.

4.1.2 Lighting Control Measures

Lighting control measures include several "submeasures" as outlined in Figure 17 below.

Figure 17 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		25,579	6.5	0.0	$3,233.06	$10,556.00	$1,820.00	$8,736.00	2.70	25,758
ECM 5	Install Occupancy Sensor Lighting Controls	25,579	6.5	0.0	$3,233.06	$10,556.00	$1,820.00	$8,736.00	2.70	25,758

ECM 5: 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)
25,579	6.5	0.0	$3,233.06	$10,556.00	$1,820.00	$8,736.00	2.70	25,758

Measure Description

This measure evaluates installing occupancy sensors to control light fixtures that are currently manually controlled in classrooms, restrooms, storage rooms, and offices. Sensors detect occupancy using ultrasonic and/or infrared wave technologies. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Occupants will also be able to manually turn off fixtures. Energy savings result 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. Ceiling-mounted or remote-mounted sensors require the use of low voltage switching relays or a wireless signal to the switch. In general, use wall switch replacement sensors for single occupant offices and other small rooms. Install ceiling-mounted or remote mounted sensors in locations without local switching, in situations where the existing wall switches are not in the line-of-sight of the main work area, and in large spaces. We recommend a holistic design approach that considers both the technology of the lighting sources and how they are controlled.

Maintenance savings are anticipated due to reduced lamp operation, however, additional maintenance costs may be incurred because the occupancy sensors may require periodic adjustment; it is anticipated that the net effect on maintenance costs will be negligible.

Please refer to Appendix A: Equipment Inventory & Recommendations for a detailed list of the locations and light fixtures affected by this measure.

4.1.3 Domestic Water Heating Upgrade

Domestic water heating measures include several "submeasures" as outlined in Figure 18 below.

Figure 18 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		24,258	2.7	397.3	$4,885.16	$1,886.79	$50.00	$1,836.79	0.38	70,946
ECM 6	Install High Efficiency Gas Water Heater	15,240	2.7	-52.0	$1,688.21	$1,406.40	$50.00	$1,356.40	0.80	9,258
ECM 7	Install Low-Flow Domestic Hot Water Devices	9,018	0.0	449.3	$3,196.95	$480.39	$0.00	$480.39	0.15	61,687

ECM 6: Install High Efficiency Gas Water Heater

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)
15,240	2.7	-52.0	$1,688.21	$1,406.40	$50.00	$1,356.40	0.80	9,258

Measure Description

This measure evaluates the savings from replacing a tank water heater with a high efficiency tank water heater. Improvements in combustion efficiency and reductions in heat loss have improved the overall efficiency of water heaters. Savings result from less gas used during combustion and less time operating during standby to maintain the water tank temperature.

Please refer to Appendix A: Equipment Inventory & Recommendations for more information about the equipment affected by this measure.

ECM 7: Install Low-Flow DHW Devices

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
9,018	0.0	449.3	$3,196.95	$480.39	$0.00	$480.39	0.15	61,687

Measure Description

This measure evaluates the savings from installing low flow domestic water devices to reduce overall water flow in general and hot water flow in particular. Low flow showerheads and faucet aerators reduce the water flow, relative to standard showerheads and aerators, from the fixture. Pre-rinse spray valves—often used in commercial and institutional kitchens and are designed to remove food waste from dishes

prior to dishwashing. Replacing standard pre-rinse spray valves with low flow valves will reduce water use.

All of the low flow devices reduce the overall water flow from the fixture which generally reduces the amount of hot water used resulting in energy and water savings.

Please refer to Appendix A: Equipment Inventory & Recommendations for more information about the equipment affected by this measure.

4.1.4 Food Service Equipment & Refrigeration Measures

Food service and refrigeration measures include several "submeasures" as outlined in Figure 19 below.

Figure 19 - Summary of Food Service Equipment & Refrigeration ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Food Service Equipment & Refrigeration Measures		379	0.0	0.0	$47.84	$1,248.00	$75.00	$1,173.00	24.52	381
ECM 8	Replace Refrigeration Equipment	379	0.0	0.0	$47.84	$1,248.00	$75.00	$1,173.00	24.52	381

ECM 8: Replace Refrigeration Equipment

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)
379	0.0	0.0	$47.84	$1,248.00	$75.00	$1,173.00	24.52	381

Measure Description

This measure evaluates replacing existing commercial refrigerator with new ENERGY STAR® efficient equipment. There have been many improvements in refrigeration system equipment, operation, and insulation. The savings associated with this measure come from reduced power draw and run times.

Please refer to Appendix A: Equipment Inventory & Recommendations for more information about the equipment affected by this measure.

4.1.5 Plug Load Equipment Control - Vending Machine

ECM 9: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,612	0.0	0.0	$203.73	$718.80	$0.00	$718.80	3.53	1,623

Measure Description

Vending machines operate continuously, even during non-business hours. It is recommended to install occupancy sensor based controls to reduce the energy use. These controls power down the machine when the surrounding area is vacant, then monitor the surrounding temperature and power up the cooling system at regular intervals to keep the product cool. Savings are a function of the activity level around the vending machine.

Please refer to Appendix A: Equipment Inventory & Recommendations for more information about the equipment affected by this measure.

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 low or no-cost efficiency strategies. By employing certain behavioral and operational adjustments as well as performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and annual energy, operation, and maintenance 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.

Use Window Treatments/Coverings

A substantial amount of heat gain can occur through uncovered or untreated windows, especially older single pane windows and east or west-facing windows. Treatments such as high-reflectivity films or covering windows with shades or shutters can reduce solar heat gain and, consequently, cooling load and can reduce internal heat loss and the associated heating load.

Perform Proper Lighting Maintenance

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

Develop a Lighting Maintenance Schedule

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

Ensure Lighting Controls Are Operating Properly

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

Turn Off Unneeded Motors

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

Perform Routine Motor Maintenance

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

Use Fans to Reduce Cooling Load

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

Practice Proper Use of Thermostat Schedules and Temperature Resets

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

Ensure Economizers are Functioning Properly

Economizers, when properly configured, can be used to significantly reduce mechanical cooling. However, if the outdoor thermostat or enthalpy control is malfunctioning or the damper is stuck or improperly adjusted, benefits from the economizer may not be fully realized. As such, periodic inspection and maintenance is required to ensure proper operation. This maintenance should be scheduled with maintenance of the facility's air conditioning system and should include proper setting of the outdoor thermostat/enthalpy control, inspection of control and damper operation, lubrication of damper connections and adjustment of minimum damper position. A malfunctioning economizer can significantly increase the amount of heating and mechanical cooling required by introducing excess amounts of cold or hot outside air.

Assess Chillers & Request Tune-Ups

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

Clean Evaporator/Condenser Coils on AC Systems

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

Clean and/or Replace HVAC Filters

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

Check for and Seal Duct Leakage

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

Perform Proper Boiler Maintenance

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

Perform Proper Furnace Maintenance

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

Perform Proper Water Heater Maintenance

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

Perform Maintenance on Compressed Air Systems

Like all electro-mechanical equipment, compressed air systems require periodic maintenance to operate at peak efficiency. A maintenance plan should be developed for process related compressed air systems to include inspection, cleaning, and replacement of inlet filter cartridges, cleaning of drain traps, daily inspection of lubricant levels to reduce unwanted friction, inspection of belt condition and tension, checking for system leaks and adjustment of loose connections, and overall system cleaning. Contact a qualified technician for help with setting up periodic maintenance schedule.

Replace Computer Monitors

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

Water Conservation

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

Installing dual flush or low flow toilets and low flow or waterless urinals are additional ways to reduce the sites water use, however, these devices do not provide energy savings at the site level. Any reduction in water use does however ultimately reduce grid level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users. The EPA WaterSense™ ratings for urinals is 0.5 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). Refer to Section 4.1.3 for low-flow ECM recommendations.

6 SELF-GENERATION MEASURES

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

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

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

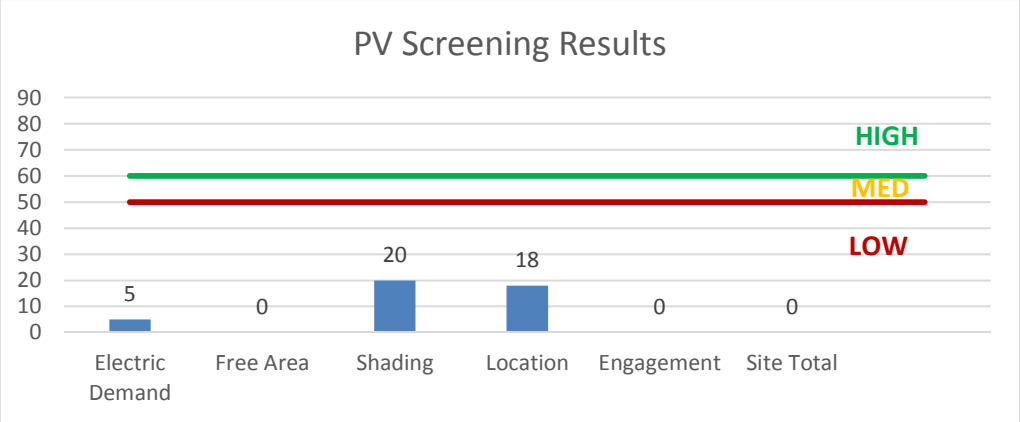
6.1 Photovoltaic

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

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

In order to be cost-effective, a solar PV array generally needs a minimum of 4,000 square feet of flat or south-facing rooftop, or other unshaded space, on which to place the PV panels. The facility has used available roof top free space to install PV array.

Figure 20 - Photovoltaic Screening



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

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

In non-industrial settings, combined heat and power (CHP) is the on-site generation of electricity and recovery of heat which is put to beneficial use. Common prime movers in CHP applications include reciprocating engines, microturbines, fuel cells, and (at large facilities) gas turbines. Electricity is typically interconnected to the sites local distribution system. Heat is recovered from the exhaust stream and the ancillary cooling system and interconnected to the existing hot water (or steam) distribution system.

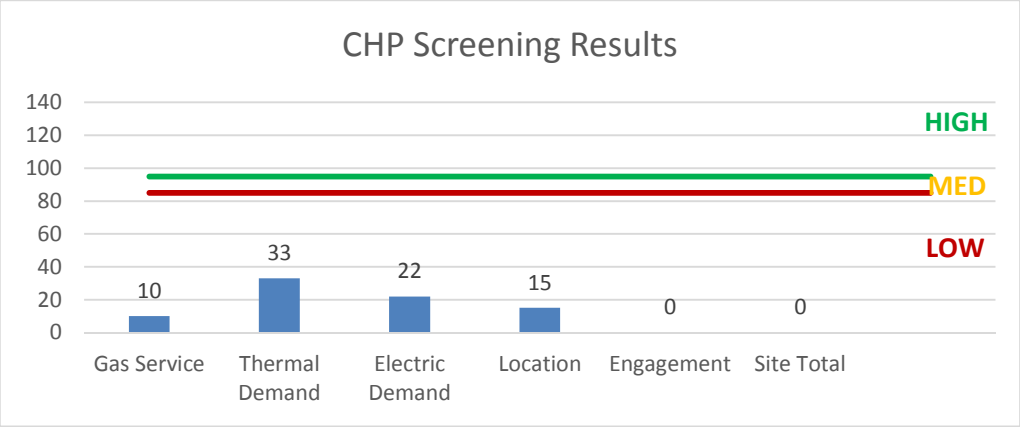
CHP systems are typically used to produce a portion of the electricity needed by a facility, with the balance of electric needs satisfied by purchase from the grid. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

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

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

For a list of qualified firms in NJ 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 21 - Combined Heat and Power Screening



7 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and others, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's 1999 Electricity Restructuring Law which requires all customers of investor-owned electric and gas utilities to pay this charge on their monthly energy bills. As a contributor to the fund you were able to participate in the LGEA program and are also eligible to utilize the equipment incentive programs. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 22 for a list of the eligible programs identified for each recommended ECM.

Figure 22 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Pay For Performance Existing Buildings
ECM 1	Install LED Fixtures	x		x
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers			x
ECM 3	Retrofit Fixtures with LED Lamps	x		x
ECM 4	Install LED Exit Signs			x
ECM 5	Install Occupancy Sensor Lighting Controls	x		x
ECM 6	Install High Efficiency Gas Water Heater	x		x
ECM 7	Install Low-Flow Domestic Hot Water Devices			x
ECM 8	Replace Refrigeration Equipment	x		x
ECM 9	Vending Machine Control			x

SmartStart is generally well suited for implementation of individual or small sets of measures, with the flexibility to install projects at your own pace using in-house staff or a preferred contractor. Direct Install (DI) caters to small to mid-size facilities to bundle measures and simplify participation, 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 and requires implementation of multiple measures meeting minimum savings thresholds, as well as use of pre-approved consultants.

Generally, the incentive values provided throughout the report assume the SmartStart program is utilized because it provides a consistent comparison of available incentives.

Brief descriptions of all relevant alternative financing and incentive programs are located in the sections below. You may also check the following website for further information, including most current program availability, requirements, and incentive levels: www.njcleanenergy.com/ci.

7.1 SmartStart

Overview

The SmartStart program is comprised of new construction and retrofit components that offer incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives for various energy efficiency equipment based on national/market trends, new technologies or changes in efficiency baselines.

Prescriptive Equipment Incentives 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

All customer sizes and types may be served by this program. This program provides an effective mechanism for securing incentives for individual projects that may be completed at once or over several years.

Incentives

The prescriptive path provides fixed incentives for specific energy efficiency measures whereas the custom measure path provides incentives for unique or specialized technologies that are not addressed through prescriptive offerings.

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 the lesser of 50% of the total installed incremental project cost, or a buy down to a one year payback. 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 submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. Applicants may work with a contractor of their choosing and can also utilize internal personnel, which provides added flexibility to the program. Using internal personnel also helps improve the economics of the ECM by reducing the labor cost that is included in the tables in this report.

7.2 Pay for Performance - Existing Buildings

Overview

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

Incentives

Incentives are calculated based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.10/square foot is also available to offset the cost of developing the Energy Reduction Plan (ERP), (see below) contingent on the project moving forward with measure installation.

How to Participate

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

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

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

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

7.3 Energy Savings Improvement Program

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

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

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

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

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

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

8 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

8.1 Retail Electric Supply Options

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

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

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

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

8.2 Retail Natural Gas Supply Options

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

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

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

A list of third party natural gas suppliers, 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
Exterior Perimeter Light (Wall Pack)	11	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	1,300	Fixture Replacement	No	11	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	1,300	1.08	2,467	0.0	$311.79	$4,297.45	$1,100.00	10.26
Exterior Perimeter Light (Wall Pack)	8	Compact Fluorescent: 32Wx2 4-pin	Daylight Dimming	64	1,300	Fixture Replacement	No	8	LED - Fixtures: Downlight Solid State Retrofit	Daylight Dimming	14	1,300	0.26	598	0.0	$75.58	$509.21	$0.00	6.74
Exterior Perimeter Light (Recessed)	4	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	1,300	Fixture Replacement	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	1,300	0.39	897	0.0	$113.38	$1,562.71	$400.00	10.26
Parking Lot (Pole Lighting)	15	Metal Halide: (1) 400W Lamp	Daylight Dimming	458	1,300	Fixture Replacement	No	15	LED - Fixtures: High-Bay	Daylight Dimming	146	1,300	3.07	6,997	0.0	$884.34	$23,197.95	$2,250.00	23.69
North Wing (Wall Pack)	1	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	1,300	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	1,300	0.10	224	0.0	$28.34	$390.68	$100.00	10.26
North Wing (Recessed)	4	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	1,300	Fixture Replacement	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	1,300	0.39	897	0.0	$113.38	$1,562.71	$400.00	10.26
West Wing (Recessed)	11	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	1,300	Fixture Replacement	No	11	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	1,300	1.08	2,467	0.0	$311.79	$4,297.45	$1,100.00	10.26
west Wing (Wall Pack))	11	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	1,300	Fixture Replacement	No	11	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	1,300	1.08	2,467	0.0	$311.79	$4,297.45	$1,100.00	10.26
west Wing (Wall Pack))	2	Compact Fluorescent: 32Wx2 4-pin	Daylight Dimming	64	1,300	Fixture Replacement	No	2	LED - Fixtures: Downlight Solid State Retrofit	Daylight Dimming	14	1,300	0.07	150	0.0	$18.90	$127.30	$0.00	6.74
South Wing (Wall Pack)	3	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	1,300	Fixture Replacement	No	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	1,300	0.29	673	0.0	$85.03	$1,172.03	$300.00	10.26
South Wing (Recessed)	2	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	1,300	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	1,300	0.20	449	0.0	$56.69	$781.35	$200.00	10.26
Maintenance Hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,250	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,250	0.16	640	0.0	$80.94	$376.00	$75.00	3.72
Maintenance Hallway	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	81	0.0	$10.19	$107.56	$0.00	10.56
Blue Hallway	34	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,250	Relamp	No	34	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,250	1.10	4,355	0.0	$550.42	$2,556.80	$510.00	3.72
Blue Hallway	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,250	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.17	683	0.0	$86.34	$468.00	$80.00	4.49
Blue Hallway	4	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	322	0.0	$40.75	$430.22	$0.00	10.56
Purple Hallway	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,250	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,250	0.42	1,665	0.0	$210.45	$977.60	$195.00	3.72
Purple Hallway	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	81	0.0	$10.19	$107.56	$0.00	10.56
Kindergarden Hallway	17	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,250	Relamp	No	17	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	0.62	2,463	0.0	$311.35	$1,617.27	$340.00	4.10
Kindergarden Hallway	2	Exit Signs: Incandescent	Wall Switch	14	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.01	161	0.0	$20.37	$215.11	$0.00	10.56
Kindergarden Hallway	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,250	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,250	0.02	75	0.0	$9.48	$63.20	$0.00	6.66
Common Area	4	Metal Halide: (1) 250W Lamp	Wall Switch	295	2,250	Fixture Replacement	Yes	4	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	40	1,575	0.70	2,763	0.0	$349.29	$370.60	$40.00	0.95
Common Area	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,250	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.17	683	0.0	$86.34	$468.00	$80.00	4.49
Common Area	2	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	161	0.0	$20.37	$215.11	$0.00	10.56
Yellow Hallway	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,250	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,250	0.39	1,537	0.0	$194.27	$902.40	$180.00	3.72

	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
Main Lobby	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,250	Relamp	No	22	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,250	0.71	2,818	0.0	$356.15	$1,654.40	$330.00	3.72
Main Lobby	3	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	242	0.0	$30.56	$322.67	$0.00	10.56
Green Hallway	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,250	Relamp	No	17	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,250	0.55	2,177	0.0	$275.21	$1,278.40	$255.00	3.72
Green Hallway	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	81	0.0	$10.19	$107.56	$0.00	10.56
Cafeteria	21	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	No	21	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	1.62	6,412	0.0	$810.42	$3,398.50	$0.00	4.19
Cafeteria	2	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	161	0.0	$20.37	$215.11	$0.00	10.56
Teacher Lunch Room	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	No	6	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	0.46	1,832	0.0	$231.55	$971.00	$0.00	4.19
Kitchen	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	0.15	611	0.0	$77.18	$323.67	$0.00	4.19
Kitchen	21	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	21	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.81	3,206	0.0	$405.21	$2,457.00	$0.00	6.06
Kitchen	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	81	0.0	$10.19	$107.56	$0.00	10.56
Boys Bathroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.09	350	0.0	$44.28	$233.00	$20.00	4.81
Boys Bathroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.08	305	0.0	$38.59	$117.00	$0.00	3.03
Girls Bathroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.09	350	0.0	$44.28	$233.00	$20.00	4.81
Girls Bathroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.08	305	0.0	$38.59	$117.00	$0.00	3.03
Room 245	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.53	2,102	0.0	$265.69	$686.78	$20.00	2.51
Room 245	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	81	0.0	$10.19	$107.56	$0.00	10.56
Room 244	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.09	350	0.0	$44.28	$233.00	$20.00	4.81
Room 244	1	Linear Fluorescent - T12: 2' T12 (20W) - 1L	Wall Switch	25	2,250	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,250	0.01	43	0.0	$5.40	$31.90	$0.00	5.91
Room 243	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.09	350	0.0	$44.28	$233.00	$20.00	4.81
Room 243	1	Linear Fluorescent - T12: 2' T12 (20W) - 1L	Wall Switch	25	2,250	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,250	0.01	43	0.0	$5.40	$31.90	$0.00	5.91
Room 267	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 266	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 259	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 258	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 262	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 263	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 264	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 265	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 261	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Gymnasium	16	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	120	2,250	Relamp	No	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	0.65	2,567	0.0	$324.43	$1,522.08	$320.00	3.71
Gymnasium	4	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	322	0.0	$40.75	$430.22	$0.00	10.56
Gym Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$306.26	$20.00	3.23
Bathroom	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	0.08	305	0.0	$38.59	$95.13	$0.00	2.47
Girls Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,250	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,575	0.03	101	0.0	$12.72	$179.20	$20.00	12.51
Girls Bathroom	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	No	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	0.23	916	0.0	$115.77	$285.39	$0.00	2.47
Boys Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,250	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,575	0.03	101	0.0	$12.72	$179.20	$20.00	12.51
Boys Bathroom	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	No	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	0.23	916	0.0	$115.77	$285.39	$0.00	2.47
Gym Storage	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.36	1,401	0.0	$177.13	$496.52	$20.00	2.69
Room 223	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 213	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 215 (Library)	58	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	2,250	Relamp & Reballast	Yes	58	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,575	1.86	7,339	0.0	$927.57	$4,129.60	$80.00	4.37
Room 215 (Library)	2	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	161	0.0	$20.37	$215.11	$0.00	10.56
Library Office	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.36	1,401	0.0	$177.13	$496.52	$20.00	2.69
Room 216	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.36	1,401	0.0	$177.13	$496.52	$20.00	2.69
Hallway Exposition light	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.08	305	0.0	$38.59	$117.00	$0.00	3.03
Room 218	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 219	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.36	1,401	0.0	$177.13	$496.52	$20.00	2.69
Room 136	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.09	350	0.0	$44.28	$233.00	$20.00	4.81
Room 221	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.36	1,401	0.0	$177.13	$496.52	$20.00	2.69
Room 222	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.36	1,401	0.0	$177.13	$496.52	$20.00	2.69

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 211	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.13	526	0.0	$66.42	$291.50	$20.00	4.09
Room 212	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.04	175	0.0	$22.14	$174.50	$20.00	6.98
Room 185	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.36	1,401	0.0	$177.13	$496.52	$20.00	2.69
Room 186	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 187	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 202	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.36	1,401	0.0	$177.13	$496.52	$20.00	2.69
Room 201	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 200	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 188	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 189	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 196	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 198	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Front Entrance Hallway	1	Compact Fluorescent: 26W 4-pin	Wall Switch	26	2,250	Fixture Replacement	No	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	13	2,250	0.01	34	0.0	$4.25	$63.65	$0.00	14.97
Room 195	12	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	1.07	4,204	0.0	$531.39	$1,257.56	$20.00	2.33
Room 196	12	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	1.07	4,204	0.0	$531.39	$1,257.56	$20.00	2.33
Mechanical Closet	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.04	153	0.0	$19.30	$95.13	$0.00	4.93
Room 123	17	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	17	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	1.51	5,956	0.0	$752.80	$1,110.50	$20.00	1.45
Room 191	21	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	21	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	1.86	7,357	0.0	$929.93	$2,229.73	$40.00	2.35
Room 194	12	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	1.07	4,204	0.0	$531.39	$1,257.56	$20.00	2.33
Room 194	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.08	305	0.0	$38.59	$117.00	$0.00	3.03
Room 193	19	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	19	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	1.69	6,657	0.0	$841.36	$1,923.47	$20.00	2.26
Custodial Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,250	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.02	85	0.0	$10.79	$58.50	$10.00	4.49
Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,250	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.16	647	0.0	$81.83	$467.00	$80.00	4.73
Boiler Room	10	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.39	1,527	0.0	$192.96	$585.00	$0.00	3.03
Boiler Room	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	81	0.0	$10.19	$107.56	$0.00	10.56

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Maintenance Shop	5	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.22	876	0.0	$110.71	$408.50	$20.00	3.51
Closet	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.13	526	0.0	$66.42	$291.50	$20.00	4.09
Room 176	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 177	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 178	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 179	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 170	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 171	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 169	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 184	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 164	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.44	1,752	0.0	$221.41	$591.65	$20.00	2.58
Room 138 (Boys Bathroom)	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.13	526	0.0	$66.42	$291.50	$20.00	4.09
Room 138 (Boys Bathroom)	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.08	305	0.0	$38.59	$117.00	$0.00	3.03
Closet	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.04	153	0.0	$19.30	$58.50	$0.00	3.03
Room 137 (Girls Bathroom)	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.13	526	0.0	$66.42	$291.50	$20.00	4.09
Room 137 (Girls Bathroom)	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,250	0.08	305	0.0	$38.59	$117.00	$0.00	3.03
Room 133	11	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.98	3,854	0.0	$487.10	$1,162.43	$20.00	2.35
Room 132	12	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	1.07	4,204	0.0	$531.39	$1,257.56	$20.00	2.33
Room 120	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,500	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,500	0.32	854	0.0	$107.93	$752.00	$150.00	5.58
Storage	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$306.26	$20.00	3.23
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,500	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,500	0.03	85	0.0	$10.79	$75.20	$15.00	5.58
Mechanical Room	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	0.08	305	0.0	$38.59	$95.13	$0.00	2.47
Room 121	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,500	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,500	0.39	1,025	0.0	$129.51	$902.40	$180.00	5.58
Room 121	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
Room 122	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,500	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,500	0.39	1,025	0.0	$129.51	$902.40	$180.00	5.58

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 122	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
Room 128	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 129	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 123	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 124	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 126	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Room 127	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.80	3,153	0.0	$398.54	$972.17	$20.00	2.39
Auditorium	20	Incandescent: Recessed 500W	Wall Switch	500	2,250	Fixture Replacement	No	20	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	70	2,250	5.64	22,253	0.0	$2,812.61	$1,273.02	$100.00	0.42
Auditorium	5	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	5	LED Exit Signs: 2 W Lamp	None	6	8,760	0.03	403	0.0	$50.93	$537.78	$0.00	10.56
Auditorium	9	Incandescent: 500W 2-pin (spot Light)	Wall Switch	500	2,250	Fixture Replacement	No	9	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	70	2,250	2.54	10,014	0.0	$1,265.67	$572.86	$45.00	0.42
Auditorium Stage	190	Halogen Incandescent: PAR30 90W (Spot Light)	Wall Switch	90	2,250	Fixture Replacement	No	190	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	19	2,250	8.84	34,905	0.0	$4,411.87	$12,093.69	$950.00	2.53
Room 102	5	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.22	876	0.0	$110.71	$408.50	$20.00	3.51
Main Office (Reception Area)	15	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	2,250	Relamp & Reballast	Yes	15	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,575	0.48	1,898	0.0	$239.89	$1,064.00	$20.00	4.35
Main Office (Reception Area)	3	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	242	0.0	$30.56	$322.67	$0.00	10.56
Room 144 (Copy Room)	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$306.26	$20.00	3.23
Room 155 (Storage)	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$306.26	$20.00	3.23
Room 151	8	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.71	2,803	0.0	$354.26	$877.04	$20.00	2.42
Room 151	3	Exit Signs: Incandescent	Wall Switch	14	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.02	242	0.0	$30.56	$322.67	$0.00	10.56
Room 146 (Principal Office)	3	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	2,250	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,575	0.10	380	0.0	$47.98	$467.00	$20.00	9.32
Storage	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,250	0.08	305	0.0	$38.59	$161.83	$0.00	4.19
Room 148 (Rest Room)	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.04	175	0.0	$22.14	$233.00	$20.00	9.62
Room 155	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$439.67	$20.00	4.74
Room 156	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$439.67	$20.00	4.74
Unoccupied Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$439.67	$20.00	4.74
Room 157	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$439.67	$20.00	4.74

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 167	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.36	1,401	0.0	$177.13	$763.33	$20.00	4.20
Room 165	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$439.67	$20.00	4.74
Room 166	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$439.67	$20.00	4.74
Conference Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,575	0.18	701	0.0	$88.56	$439.67	$20.00	4.74
Men staff Bathroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.09	350	0.0	$44.28	$350.00	$20.00	7.45
Women Staff Bathroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,250	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,575	0.09	350	0.0	$44.28	$350.00	$20.00	7.45

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 Top	Boiler Room	1	Exhaust Fan	0.3	84.0%	No	2,000	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Kitchen	1	Kitchen Hood Exhaust Fan	0.5	82.0%	No	800	No	82.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Yellow Hallway	2	Exhaust Fan	0.3	85.0%	No	2,000	No	85.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Chiller	2	Chilled Water Pump	15.0	92.0%	No	2,500	No	92.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	DHW circulation pump motor	2	Other	0.5	82.0%	No	2,000	No	82.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof Top	Copy Room	1	Split-System AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Cafeteria	1	Packaged AC	20.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top (AC3)	Library Office	1	Packaged AC	12.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top (AC1)	Auditorium	1	Packaged AC	25.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Classrooms (120,121,122)	2	Split-System AC	10.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top (AC2)	Library	1	Packaged AC	10.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Common Area	1	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Room 193	1	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Room 194	1	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Room 195	1	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Room 192	1	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Room 191	1	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Lindergarden Hallway	1	Packaged AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	School	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Main Office	1	Split-System AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	IT Room	1	Split-System AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Room 216	1	Split-System AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Room 218	1	Split-System AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Kitchen	1	Packaged AC	7.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric Chiller Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Exteriro East Wing	Classrooms	1	Air-Cooled Screw Chiller	164.10	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	School	2	Condensing Hot Water Boiler	2,000.00	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
Custodial Closet	Kindergarden	1	Storage Tank Water Heater (≤ 50 Gal)	Yes	1	Storage Tank Water Heater (≤ 50 Gal)	Natural Gas	67.00%	EF	2.70	15,240	-53.3	$1,682.26	$1,406.40	$50.00	0.81
Boiler Room	School	2	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Throughout the facility	58	Faucet Aerator (Lavatory)	2.50	1.00	0.00	0	424.0	$1,941.14	$415.86	$0.00	0.21
Kindergarden	5	Faucet Aerator (Lavatory)	2.50	1.00	0.00	9,018	0.0	$1,139.78	$35.85	$0.00	0.03
Kitchen	4	Faucet Aerator (Kitchen)	3.50	2.20	0.00	0	25.3	$116.02	$28.68	$0.00	0.25

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	2	Cooler (35F to 55F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Cooler (35F to 55F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Cooler (35F to 55F)	No	No	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Walk-In Cooler/Freezer Inventory & Recommendations

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

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	3	Stand-Up Refrigerator, Solid Door (≤15 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Refrigerator, Solid Door (≤15 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School facililty	4	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Maintenance Shop	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	No	Yes	0.04	379	0.0	$47.84	$1,248.00	$75.00	24.52

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Gas Convection Oven (Half Size)	Yes	No	0.00	0	0.0	$0.00	$7,118.81	$500.00	0.00
Kitchen	1	Gas Convection Oven (Full Size)	Yes	No	0.00	0	0.0	$0.00	$9,290.04	$500.00	0.00
Kitchen	2	Electric Griddle (3 Feet Width)	Yes	No	0.00	0	0.0	$0.00	$3,527.50	$600.00	0.00
Kitchen	2	Electric Griddle (3 Feet Width)	Yes	No	0.00	0	0.0	$0.00	$3,527.50	$600.00	0.00

Dishwasher Inventory & Recommendations

	Existing Conditions					Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Dishwasher Type	Water Heater Fuel Type	Booster Heater Fuel Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Payback w/ Incentives in Years
Kitchen	1	Single Tank Conveyor (High Temp)	Electric	N/A	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
School	182	Desktop Computer	110.0	Yes
School	19	Microwave	1,000.0	No
School	45	Interactive Panel	225.0	Yes
Schools	10	Copy Machine	950.0	Yes
Schools	10	Printer	680.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Teacher Lunch Room	1	Refrigerated	Yes	0.00	1,612	0.0	$203.73	$718.80	$0.00	3.53

Appendix B: ENERGY STAR® *Statement of Energy Performance*

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

24

ENERGY STAR® Score[1]

Herma Simmons Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 82,000
Built: 1988

For Year Ending: April 30, 2016
Date Generated: November 22, 2016

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
Herma Simmons Elementary School 300 West Chestnut Street Clayton, New Jersey 08312	_____ , (___)___-_____	___ _____ , (___)___-_____ _____

Property ID: 5327431

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
147.6 kBtu/ft²

Source EUI
219.1 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	8,528,467 (70%)
Electric - Grid (kBtu)	2,539,643 (21%)
Electric - Solar (kBtu)	1,036,412 (9%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	115.9
National Median Source EUI (kBtu/ft²)	172.1
% Diff from National Median Source EUI	27%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	744

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)