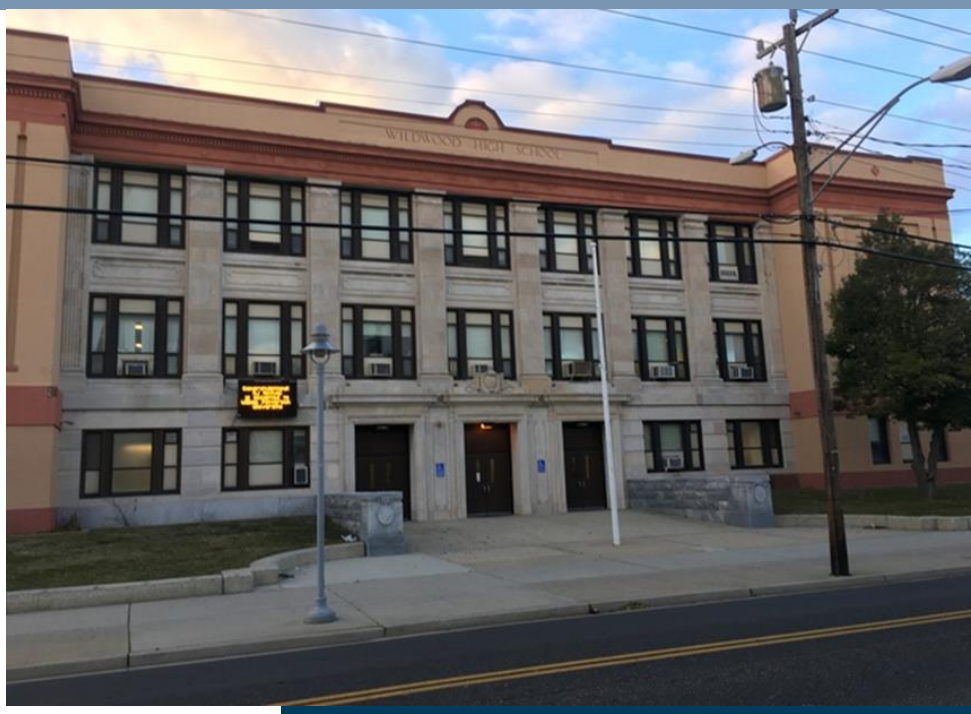
Local Government Energy Audit:
Energy Audit Report



Wildwood High School & Middle School

Wildwood City School District

4300 Pacific Avenue
Wildwood, New Jersey 08260

September 20, 2018

Final Report by:
TRC Energy Services

Disclaimer

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

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

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

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

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1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Wildwood High School & Middle School.

The goal of an LGEA report is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and provide information and assistance to help facilities implement ECMs. The LGEA report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

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

1.1 Facility Summary

Wildwood High School & Middle School is a 128,170 square foot facility comprised of various space types within one building. The original construction is 1916. The main school building is three floors and includes classrooms, offices and a sub-basement mechanical space. The main building is connected by a walkway to a later addition. The addition is two floors and contains the gym and locker rooms as well as houses various offices and classrooms.

Lighting at Wildwood High School & Middle School consists of aging and inefficient lighting including various spaces with incandescent lamps. The majority of the building is lit by T8 fixtures. Heating is supplied by two steam boilers from 1952. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 13 measures which together represent an opportunity for Wildwood High School & Middle School to reduce annual energy costs by roughly $65,021.00 and annual greenhouse gas emissions by 460,454 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in roughly 5.7 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce Wildwood High School & Middle School's annual energy use by 20%.

Figure 1 – Previous 12 Month Utility Costs

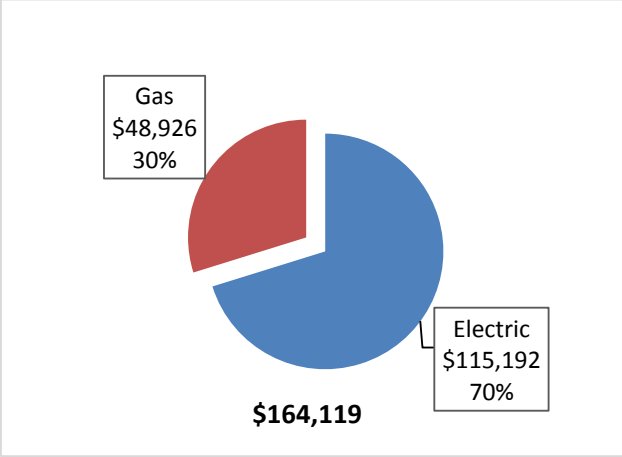
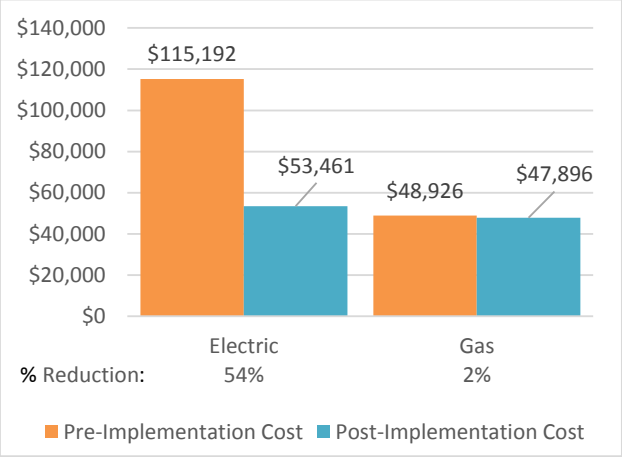


Figure 2 – Potential Post-Implementation Costs



A detailed description of Wildwood High School & Middle School's existing energy use can be found in Section 3.

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

Figure 3 – Summary of Energy Reduction Opportunities

	Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Natural Gas Savings (MMBtu)	Annual N/A Savings (MMBtu)	Annual N/A Savings (MMBtu)	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			**346,291**	**42.6**	**0.0**	**0.0**	**0.0**	**0.0**	**$51,260.83**	**$256,070.73**	**$23,305.00**	**$232,765.73**	**4.5**	**348,712**
ECM 1	Install LED Fixtures	Yes	60,226	7.4	0.0	0.0	0.0	0.0	$8,915.15	$108,580.03	$6,300.00	$102,280.03	11.5	60,647
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	228,277	28.1	0.0	0.0	0.0	0.0	$33,791.47	$139,065.83	$16,265.00	$122,800.83	3.6	229,873
ECM 3	Retrofit Fixtures with LED Lamps	Yes	57,304	7.1	0.0	0.0	0.0	0.0	$8,482.63	$7,994.64	$740.00	$7,254.64	0.9	57,705
ECM 4	Install LED Exit Signs	Yes	484	0.0	0.0	0.0	0.0	0.0	$71.58	$430.22	$0.00	$430.22	6.0	487
Lighting Control Measures			**59,989**	**7.4**	**0.0**	**0.0**	**0.0**	**0.0**	**$8,880.05**	**$35,640.00**	**$4,620.00**	**$31,020.00**	**3.5**	**60,408**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	59,989	7.4	0.0	0.0	0.0	0.0	$8,880.05	$35,640.00	$4,620.00	$31,020.00	3.5	60,408
Motor Upgrades			**2,199**	**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**$325.45**	**$3,997.38**	**$0.00**	**$3,997.38**	**12.3**	**2,214**
ECM 6	Premium Efficiency Motors	Yes	2,199	0.6	0.0	0.0	0.0	0.0	$325.45	$3,997.38	$0.00	$3,997.38	12.3	2,214
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**237.7**	**0.0**	**0.0**	**237.7**	**$2,259.42**	**$94,952.87**	**$4,512.00**	**$90,440.87**	**40.0**	**27,828**
	Install High Efficiency Steam Boilers	No	0	0.0	237.7	0.0	0.0	237.7	$2,259.42	$94,952.87	$4,512.00	$90,440.87	40.0	27,828
HVAC System Improvements			**1,287**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**$190.50**	**$1,649.35**	**$0.00**	**$1,649.35**	**8.7**	**1,296**
ECM 7	Install Programmable Thermostats	Yes	1,287	0.0	0.0	0.0	0.0	0.0	$190.50	$1,649.35	$0.00	$1,649.35	8.7	1,296
Domestic Water Heating Upgrade			**0**	**0.0**	**108.3**	**0.0**	**0.0**	**108.3**	**$1,029.80**	**$11,543.23**	**$398.00**	**$11,145.23**	**10.8**	**12,683**
ECM 8	Install High Efficiency Gas Water Heater	Yes	0	0.0	97.8	0.0	0.0	97.8	$929.74	$11,500.21	$398.00	$11,102.21	11.9	11,451
ECM 9	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	10.5	0.0	0.0	10.5	$100.06	$43.02	$0.00	$43.02	0.4	1,232
Food Service Equipment & Refrigeration Measures			**3,695**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**$547.00**	**$2,250.41**	**$100.00**	**$2,150.41**	**3.9**	**3,721**
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,919	0.2	0.0	0.0	0.0	0.0	$284.00	$1,213.20	$0.00	$1,213.20	4.3	1,932
ECM 11	Refrigeration Controls	Yes	1,777	0.0	0.0	0.0	0.0	0.0	$263.00	$1,037.21	$100.00	$937.21	3.6	1,789
Plug Load Equipment Control - Vending Machine			**3,566**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**$527.90**	**$690.00**	**$0.00**	**$690.00**	**1.3**	**3,591**
ECM 12	Vending Machine Control	Yes	3,566	0.0	0.0	0.0	0.0	0.0	$527.90	$690.00	$0.00	$690.00	1.3	3,591
TOTALS			**417,027**	**50.8**	**346.0**	**0.0**	**0.0**	**346.0**	**$65,020.95**	**$406,793.96**	**$32,935.00**	**$373,858.96**	**5.7**	**460,454**

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

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

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

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

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

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

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

Energy Efficient Practices

TRC also identified 12 low cost or no cost energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at Wildwood High School & Middle School include:

- Reduce Air Leakage
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Perform Routine Motor Maintenance
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Check for and Seal Duct Leakage
- Repair/Replace Steam Traps
- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Water Conservation

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

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation for Wildwood High School & Middle School. Based on the configuration of the site and its loads there is a moderate potential for installing a photovoltaic (PV) array and a Reciprocating Engine CHP system.

Figure 4 – Photovoltaic Potential

Potential	Medium	
System Potential	54	kW DC STC
Electric Generation	40,632	kWh/yr
Displaced Cost	$3,530	/yr
Installed Cost	$154,400	

Figure 5 – Combined Heat and Power Potential

Potential	Medium	
System Type	Recip Engine	
System Potential	180	kW
Electric Generation	1,239,350	kWh/yr
Thermal Generation	6,862,458	MBtu/yr
Displaced Cost	$79,414	/yr
Installed Cost	$913,000	

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

1.3 Implementation Planning

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

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

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

- SmartStart
- Pay for Performance (P4P)
- Combined Heat and Power Program
- Energy Savings Improvement Program (ESIP)
- Demand Response Aggregator

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

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

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

The Combined Heat & Power Program can be a significant source of funding for this facility since it was identified as a good candidate for CHP on-site generation. As with other programs, please be sure to check the NJCEP website for latest details on current program availability and incentive levels.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.5 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce electric loads at commercial facilities, when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

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

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 6 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Martha Jamison	Business Administrator	mjamison@wwschools.org	609.522.0786
Patrick Quinlan	Facilites Supervisor	pquinlan@wwschools.org	609.522.0786
TRC Energy Services			
Ignacio Badilla	Auditor	ibadilla@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On February 16, 2017, TRC performed an energy audit at Wildwood High School & Middle School located in Wildwood, New Jersey. TRC 's team met with Patrick Quinlan to review the facility operations and help focus our investigation on specific energy-using systems.

Wildwood High School & Middle School is a 128,170 square foot facility comprised of various space types within one building. The original construction is 1916. The main school building is three floors and includes classrooms, offices and a sub-basement mechanical space. The main building is connected by a walkway to a later addition. The addition is two floors and contains the gym and locker rooms as well as houses various offices and classrooms.

The facility is lit mainly with T8 troffers with diffusers however, there are still large amounts of incandescent lamps throughout the facility. The boilers, located in the mechanical room are steam boilers from the 1950's and provide steam heat to the majority of the original building. There is also a heat exchanger that supplies heating hot water to the gymnasium addition. The classrooms are un-cooled except for the ones that have window air conditioners. The offices, computer labs and math labs are cooled with split systems.

2.3 Building Occupancy

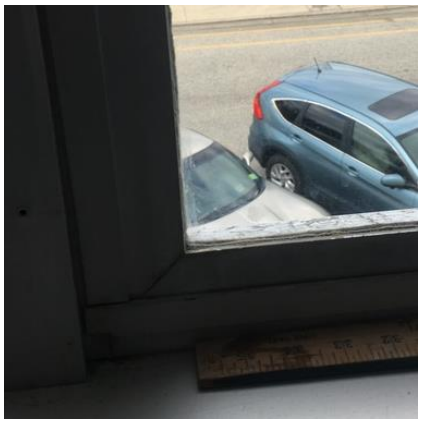
The school building is open Monday through Friday with after school sports and activities throughout the year. The typical schedule is presented in the table below. The entire facility is used year round with summer school programs during the summer. During a typical day, the facility is occupied by approximately 60 teaching faculty and 400 students.

Figure 7 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Wildwood Highschol	Weekday	6:00 AM - 11:00PM
Wildwood Highschol	Weekend	10:00 AM - 11:00PM

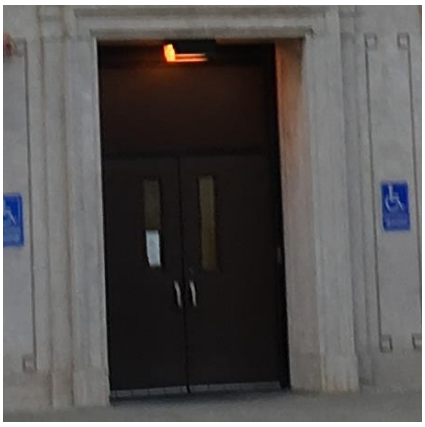
2.4 Building Envelope

The buildings are constructed of concrete block and structural steel with a stone facade. The additions to the building have flat roofs covered with black membrane that is in good condition. The original building has a hip slag roof that is also in good condition. The buildings have single pane windows which are in good condition and show little sign of excessive infiltration. The exterior doors are constructed of aluminum and in good condition except that the door seals have worn out which increases the level of outside air infiltration.



Picture 1: Single Pane Window

Picture 2: Building Exterior



Picture 3: Front Doors

2.5 On-Site Generation

Wildwood High School & Middle School does not have any on-site electric generation capacity except for emergency generation.

2.6 Energy-Using Systems

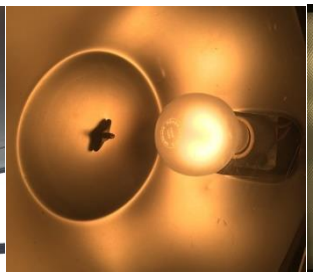
Please see Appendix A: Equipment Inventory & Recommendations for an inventory of the facility's equipment.

Lighting System

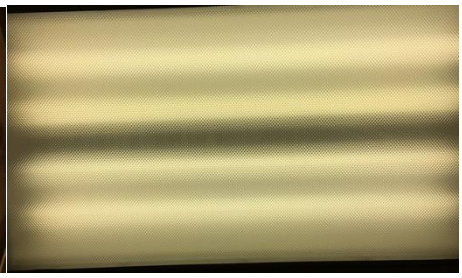
Lighting at the facility is provided mostly by 32-Watt linear fluorescent T8 lamps with electronic ballasts as well incandescent lamps in the locker rooms, bathrooms, and storage areas. Most of the fixtures are 2-lamp or 4-lamp, 4-foot long troffers with diffusers. The majority of the hallway lighting is provided by 4 lamp 2 ft. fixtures.

Lighting control in all spaces is provided by wall switches. There are no automated lighting controls in the facility except for the exterior lights which on photocells. The exterior lighting consists of a combination of LED and high pressure sodium wall mounted area lights.

Picture 4: Incandescent Fixtures



Picture 5: Incandescent Lamps



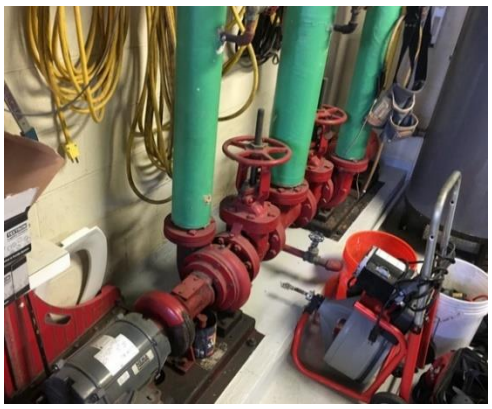
Picture 6: T8 Fixtures

Hot Water/Steam Heating System

The steam system consists of two HB Smith 1,880 kBtu/hr output, cast iron induced draft boilers installed in 1953. The boilers have since been converted to natural gas and have a nominal combustion efficiency of 75%. Steam is supplied to the 1916 and 1926 facility areas at 15 psig and supply the 1956 area via a steam to hot water heat exchanger and three HP pumps.

The boilers operate in a lead/lag configuration. Only a single boiler is required to meet the facility heating demand. Boiler operation is rotated monthly. Steam is supplied directly to air handlers 1, 2, 3 for the auditorium and cafeteria areas as well as to radiators and ventilators for the classrooms. The hot water from the heat exchangers serve the auditorium and surrounding classrooms, offices and locker rooms via unit heaters and three ventilators. The boilers are very old and at the end of their useful life however, we are not recommending their replacement as an energy efficiency measure as the efficiency gain for a steam to steam boiler replacement does not justify the cost of replacement. Converting the steam system to a hot water system with condensing boilers would increase efficiency however, it would be considered a capital improvement project.

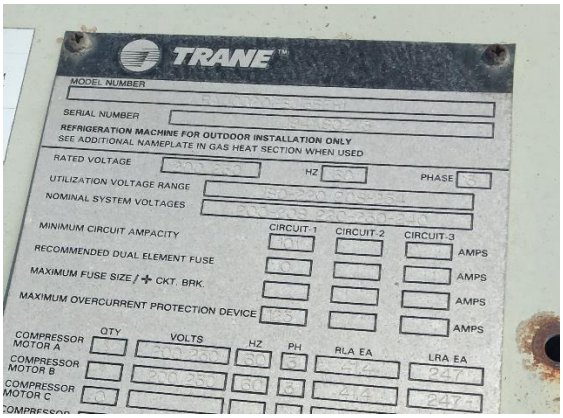
Picture 7: HB Smith Boilers



Picture 8: HW Supply Pumps

Picture 9: Pump Nameplate

Direct Expansion Air Conditioning System (DX)



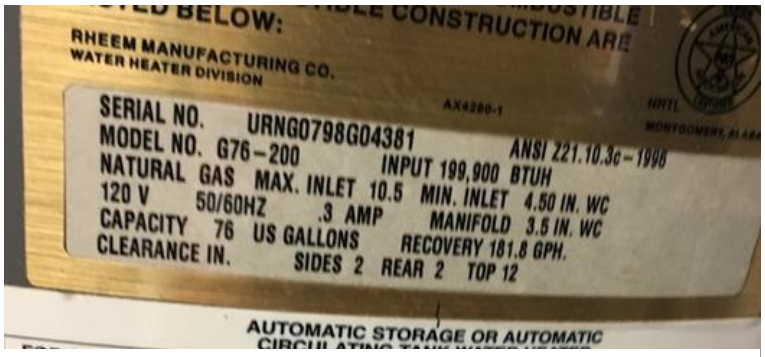
Picture 10: 20 Ton Trane Nampeplate

Picture 11: Sample Split System

The school is cooled by a variety of DX systems. The auditorium and cafeteria areas served by air handlers 1, 2, and 3 are cooled by two 20 Ton Trane (Model Number RAUCC20) split systems and one 25 ton Trane split system (Model Number RAUJ25). The systems have efficiencies of 10.5 and 11.75 EER respectively and are in good condition. The classrooms are not conditioned for the most part however, some are equipped with window units. There were 14 total window units found onsite during the inspection. The computer labs, workshops and math labs are cooled by a variety of smaller split and packaged systems most of which are in good condition. The two oldest systems are two 4 ton Carrier 50FTT005 packaged systems located on the roof next to the loading area. They are approximately 17 years old and have an EER 8.8 and are in fair condition. While the units are approaching the end of useful life, the low hours of operation and cost of replacement do not justify an upgrade at this time. The units are currently controlled by non-programmable thermostats.

Domestic Hot Water Heating System

The domestic hot water heating system for the newer areas of the facility consists of one 75 Rheem G76-200 200kBtu/hr storage tank water heater with a nominal efficiency of 75%. The older area of the facility is heated by a 200kBtu/hr storage water heater that is approximately 35 years old. The heater is in poor condition and should be replaced. Two 500-Watt recirculation pumps distribute 120°F water to the entire site.



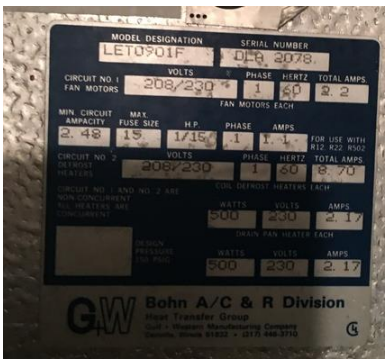
Picture12: DHW Nameplate New Section

Picture 13: DHW Older Section

Food Service & Refrigeration

The facility has a full commercial kitchen that is used to prepare breakfast and lunch for the students. The ovens and range tops are gas fired. There are also insulated holding cabinets as well as convection ovens and steam cookers that are all electric. The ovens and griddle are turned on at 6:00 AM when the kitchen staff arrive and turned off at around 2:30 PM. There is a dishwasher with an electric booster heater that provides 145°F rinse water. The dishwasher operates from 7:00 AM to 10:00 AM and again from noon to 3:00 PM. The facility has two different storage cold storage areas: a walk-in cooler area and a walk-in freezer area. The cooler area is maintained at a constant temperature of 35°F and freezer area is maintained at a constant -5°F. Both are served by two evaporator motors of 182 Watts. Both units are served by a 0.75 ton compressor. Additionally, there are two commercial refrigerators with 43.5 cu.ft. of volume. Both are in good condition.

Picture 14: Gas Stove and Range



Picture 15: Walk in Freezer Evaporator Nameplate

Picture 16: Commercial Cooler

Building Plug Load

There are roughly 150 computer work stations throughout the facility. Roughly 90% of the computers are desktop units with LCD monitors. Additionally, there are a few server closets throughout the facility. There is no centralized PC power management software installed. Additionally, there are two refrigerated vending machines, and one non-refrigerated vending machine located in the teachers' lounge along with some small office equipment and small kitchen equipment throughout.

2.7 Water-Using Systems

There are 12 restrooms at this facility. A sampling of restrooms found that the smaller restrooms in the facility had 2.2 gallons per minute (gpm) faucets while the larger student restrooms had 0.5 gpm faucets. The toilets are rated at 2.5 gallons per flush (gpf) and the urinals are rated at two gpf. There are two restrooms with showers that bicycle commuters use in the morning. There are approximately 10 shower heads per locker room however, the shower heads did not have a rating visible. These should be replaced with 2.5 gpm shower heads if they are not already low flow.

3 SITE ENERGY USE AND COSTS

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

3.1 Total Cost of Energy

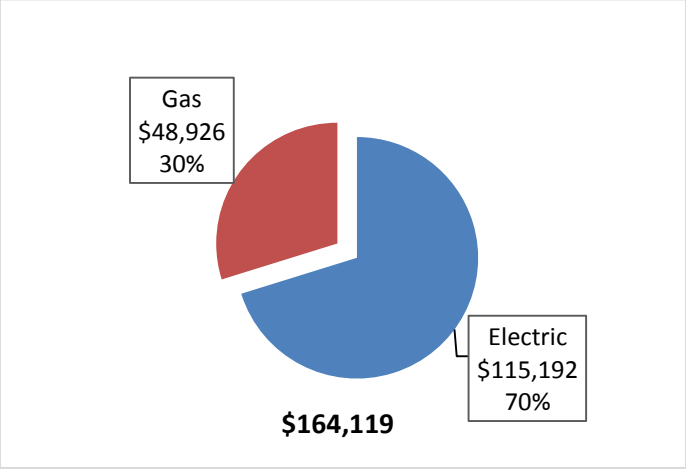
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 8 - Utility Summary

Utility Summary for Wildwood Highschool and Middle School		
Fuel	**Usage**	**Cost**
Electricity	778,178 kWh	$115,192
Natural Gas	51,466 Therms	$48,926
Total		**$164,119**

The current annual energy cost for this facility is $164,119 as shown in the chart below.

Figure 9 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by JCP&L. The average electric cost over the past 12 months was $0.148/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The main facility meter is billed for demand, the exterior lights meter is not. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 10 - Electric Usage & Demand

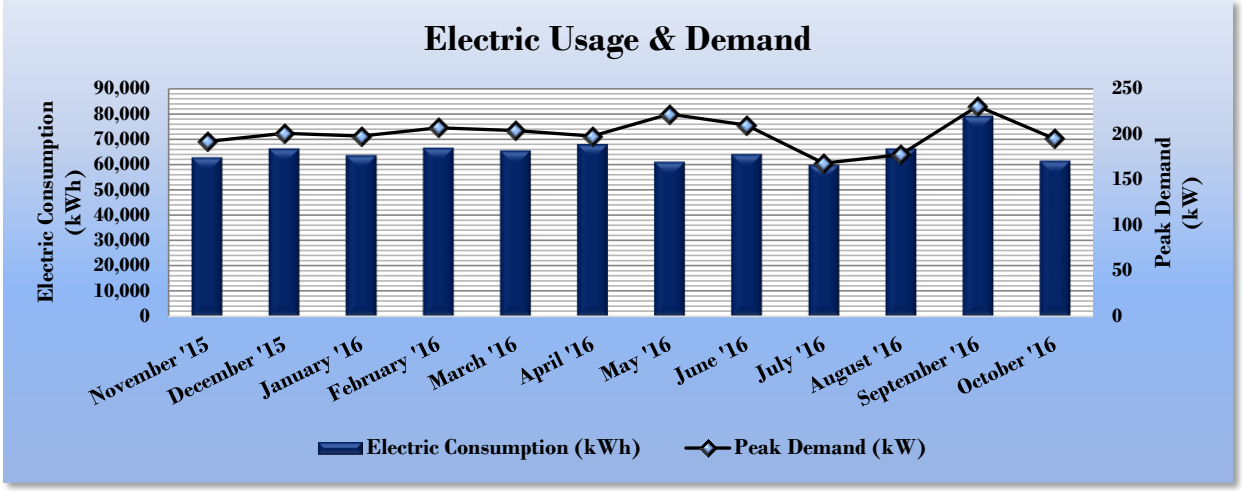


Figure 11 - Electric Usage & Demand

Electric Billing Data for Wildwood Highschool and Middle School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
12/3/15	30	62,600	192	$1,471	$9,092
1/5/16	33	66,074	201	$1,694	$9,778
2/2/16	28	63,479	198	$1,416	$9,135
3/2/16	29	66,430	207	$1,480	$9,546
4/4/16	33	65,279	204	$1,719	$9,709
5/4/16	30	67,802	198	$1,517	$9,762
6/3/16	30	60,897	222	$1,701	$9,163
7/6/16	33	63,853	210	$1,769	$9,817
8/3/16	28	59,616	168	$1,270	$8,744
9/2/16	30	66,106	178	$1,618	$9,868
10/5/16	33	78,973	231	$2,244	$11,975
11/4/16	30	61,333	195	$1,722	$9,236
Totals	**367**	**782,442**	**231**	**$19,619**	**$115,824**
Annual	**365**	**778,178**	**231**	**$19,512**	**$115,192**

3.3 Natural Gas Usage

Natural gas is provided by South Jersey Gas. The average gas cost for the past 12 months is $0.951/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below. The spike in February is due to estimated usage by the utility for some of the previous months and is not reflective of the actual usage for that month.

Figure 12 - Natural Gas Usage

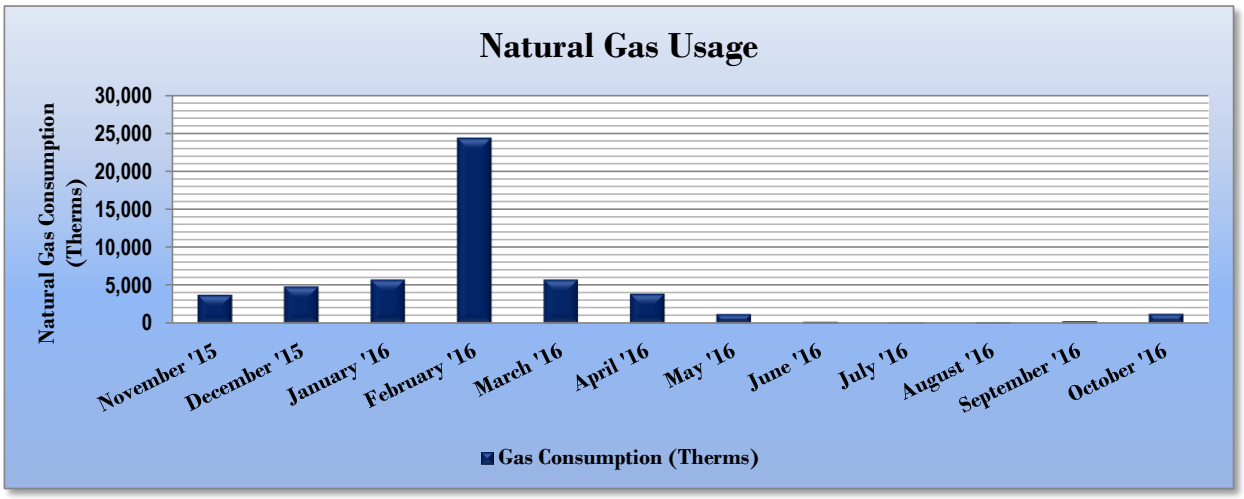


Figure 13 - Natural Gas Usage

Gas Billing Data for Wildwood Highschool and Middle School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
12/3/15	30	3,733	$3,555
1/5/16	33	4,843	$4,603
2/2/16	28	5,742	$5,416
3/2/16	29	24,308	$22,833
4/4/16	33	5,755	$5,454
5/5/16	30	3,886	$3,647
6/3/16	30	1,208	$1,167
7/6/16	33	199	$247
8/3/16	28	78	$126
9/2/16	30	180	$223
10/5/16	33	265	$311
11/2/16	28	1,268	$1,346
Totals	**365**	**51,466**	**$48,926**
Annual	**365**	**51,466**	**$48,926**

3.4 Benchmarking

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

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

Figure 14 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Wildwood Highschool and Middle School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	107.2	141.4
Site Energy Use Intensity (kBtu/ft^2)	60.9	58.2

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

Figure 15 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Wildwood Highschool and Middle School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	71.5	141.4
Site Energy Use Intensity (kBtu/ft^2)	48.9	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score 66.

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

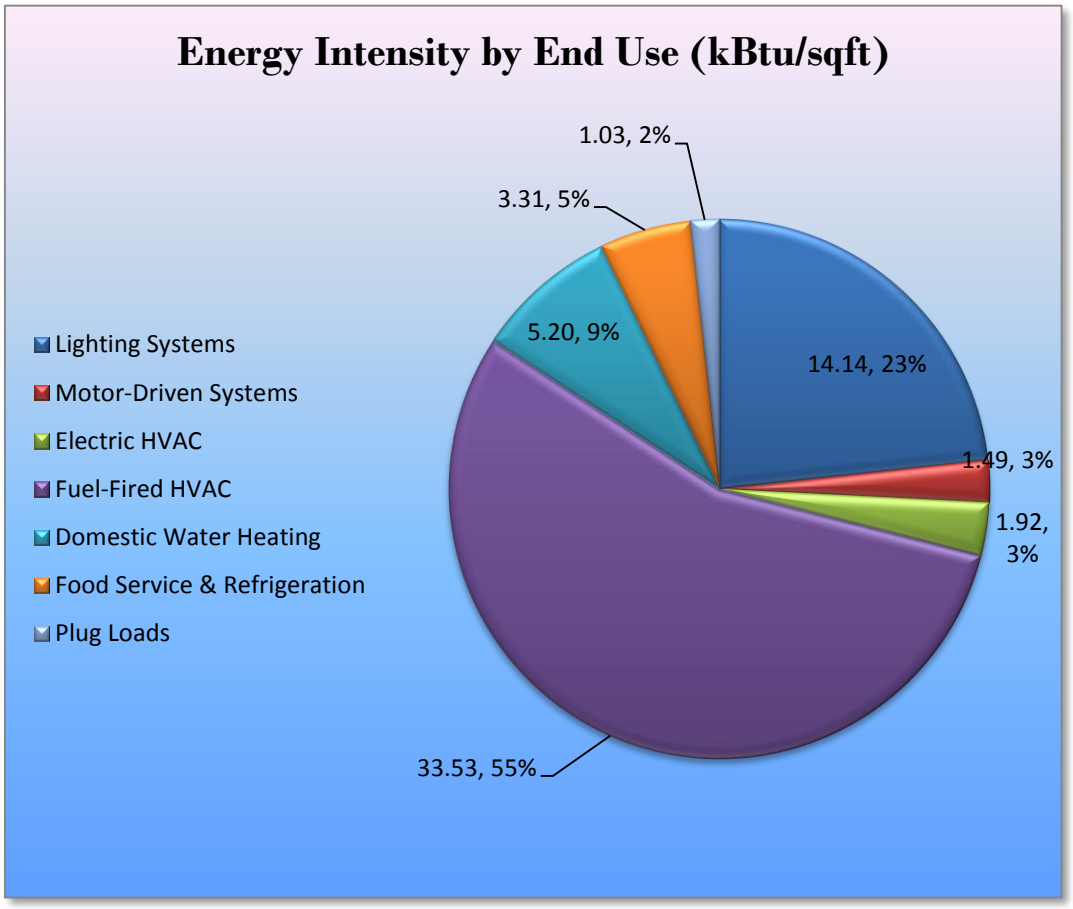
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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

3.5 Energy End-Use Breakdown

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

Figure 16 - Energy Balance (% and kBtu/SF)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

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

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 17 – 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		**346,291**	**42.6**	**0.0**	**$51,260.83**	**$256,070.73**	**$23,305.00**	**$232,765.73**	**4.5**	**348,712**
ECM 1	Install LED Fixtures	60,226	7.4	0.0	$8,915.15	$108,580.03	$6,300.00	$102,280.03	11.5	60,647
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	228,277	28.1	0.0	$33,791.47	$139,065.83	$16,265.00	$122,800.83	3.6	229,873
ECM 3	Retrofit Fixtures with LED Lamps	57,304	7.1	0.0	$8,482.63	$7,994.64	$740.00	$7,254.64	0.9	57,705
ECM 4	Install LED Exit Signs	484	0.0	0.0	$71.58	$430.22	$0.00	$430.22	6.0	487
Lighting Control Measures		**59,989**	**7.4**	**0.0**	**$8,880.05**	**$35,640.00**	**$4,620.00**	**$31,020.00**	**3.5**	**60,408**
ECM 5	Install Occupancy Sensor Lighting Controls	59,989	7.4	0.0	$8,880.05	$35,640.00	$4,620.00	$31,020.00	3.5	60,408
Motor Upgrades		**2,199**	**0.6**	**0.0**	**$325.45**	**$3,997.38**	**$0.00**	**$3,997.38**	**12.3**	**2,214**
ECM 6	Premium Efficiency Motors	2,199	0.6	0.0	$325.45	$3,997.38	$0.00	$3,997.38	12.3	2,214
HVAC System Improvements		**1,287**	**0.0**	**0.0**	**$190.50**	**$1,649.35**	**$0.00**	**$1,649.35**	**8.7**	**1,296**
ECM 7	Install Programmable Thermostats	1,287	0.0	0.0	$190.50	$1,649.35	$0.00	$1,649.35	8.7	1,296
Domestic Water Heating Upgrade		**0**	**0.0**	**108.3**	**$1,029.80**	**$11,543.23**	**$398.00**	**$11,145.23**	**10.8**	**12,683**
ECM 8	Install High Efficiency Gas Water Heater	0	0.0	97.8	$929.74	$11,500.21	$398.00	$11,102.21	11.9	11,451
ECM 9	Install Low-Flow Domestic Hot Water Devices	0	0.0	10.5	$100.06	$43.02	$0.00	$43.02	0.4	1,232
Food Service Equipment & Refrigeration Measures		**3,695**	**0.2**	**0.0**	**$547.00**	**$2,250.41**	**$100.00**	**$2,150.41**	**3.9**	**3,721**
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	1,919	0.2	0.0	$284.00	$1,213.20	$0.00	$1,213.20	4.3	1,932
ECM 11	Refrigeration Controls	1,777	0.0	0.0	$263.00	$1,037.21	$100.00	$937.21	3.6	1,789
Plug Load Equipment Control - Vending Machine		**3,566**	**0.0**	**0.0**	**$527.90**	**$690.00**	**$0.00**	**$690.00**	**1.3**	**3,591**
ECM 12	Vending Machine Control	3,566	0.0	0.0	$527.90	$690.00	$0.00	$690.00	1.3	3,591
TOTALS		**417,027**	**50.8**	**108.3**	**$62,761.53**	**$311,841.10**	**$28,423.00**	**$283,418.10**	**4.5**	**432,626**

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

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

4.1.1 Lighting Upgrades

Our recommendations for upgrades to existing lighting fixtures are summarized in Figure 18 below.

Figure 18 – 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		**346,291**	**42.6**	**0.0**	**$51,260.83**	**$256,070.73**	**$23,305.00**	**$232,765.73**	**4.5**	**348,712**
ECM 1	Install LED Fixtures	60,226	7.4	0.0	$8,915.15	$108,580.03	$6,300.00	$102,280.03	11.5	60,647
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	228,277	28.1	0.0	$33,791.47	$139,065.83	$16,265.00	$122,800.83	3.6	229,873
ECM 3	Retrofit Fixtures with LED Lamps	57,304	7.1	0.0	$8,482.63	$7,994.64	$740.00	$7,254.64	0.9	57,705
ECM 4	Install LED Exit Signs	484	0.0	0.0	$71.58	$430.22	$0.00	$430.22	6.0	487

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

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	58,502	7.2	0.0	$8,659.89	$107,408.00	$6,000.00	$101,408.00	11.7	58,911
Exterior	1,724	0.2	0.0	$255.26	$1,172.03	$300.00	$872.03	3.4	1,736

Measure Description

We recommend replacing existing fixtures containing HID or incandescent lamps with new high performance LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

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

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	228,277	28.1	0.0	$33,791.47	$139,065.83	$16,265.00	$122,800.83	3.6	229,873
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

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	57,304	7.1	0.0	$8,482.63	$7,994.64	$740.00	$7,254.64	0.9	57,705
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

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	484	0.0	0.0	$71.58	$430.22	$0.00	$430.22	6.0	487
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

4.1.2 Lighting Control Measures

Our recommendations for lighting control measures are summarized in Figure 19 below.

Figure 19 – 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		**59,989**	**7.4**	**0.0**	**$8,880.05**	**$35,640.00**	**$4,620.00**	**$31,020.00**	**3.5**	**60,408**
ECM 5	Install Occupancy Sensor Lighting Controls	59,989	7.4	0.0	$8,880.05	$35,640.00	$4,620.00	$31,020.00	3.5	60,408

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

ECM 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)
59,989	7.4	0.0	$8,880.05	$35,640.00	$4,620.00	$31,020.00	3.5	60,408

Measure Description

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

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

4.1.3 Motor Upgrades

Our recommendations for motor upgrade measures are summarized in Figure 20 below.

Figure 20-Summary of Motor Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Natural Gas Savings (MMBtu)	Annual N/A Savings (MMBtu)	Annual N/A Savings (MMBtu)	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)
ECM 6	Premium Efficiency Motors	2,199	0.6	0.0	0.0	0.0	0.0	$325.45	$3,997.38	$0.00	$3,997.38	12.3	2,214

ECM 6: Premium Efficiency Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
2,199	0.6	0.0	$325.45	$3,997.38	$0.00	$3,997.38	12.3	2,214

Measure Description

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

4.1.4 HVAC System Upgrades

Our recommendations for HVAC system improvement are summarized in Figure 21 below.

Figure 21 - Summary of HVAC System Improvement ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**1,287**	**0.0**	**0.0**	**$190.50**	**$1,649.35**	**$0.00**	**$1,649.35**	**8.7**	**1,296**
ECM 7	Install Programmable Thermostats	1,287	0.0	0.0	$190.50	$1,649.35	$0.00	$1,649.35	8.7	1,296

ECM 7: Install Programmable Thermostats

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)
1,287	0.0	0.0	$190.50	$1,649.35	$0.00	$1,649.35	8.7	1,296

Measure Description

We recommend replacing manual thermostats with programmable thermostats. Manual thermostats are generally adjusted to a single heating and cooling setpoint and left at that setting regardless of occupancy in the area served by the HVAC equipment. As a result, the same level of heating and cooling is provided regardless of the occupancy in the space. Programmable thermostats can be set to maintain different temperature settings for different times of day and for different days of the week. By reducing heating temperature setpoints and raising cooling temperature setpoints when spaces are unoccupied, the operation of the HVAC equipment is reduced while still maintaining reasonable space temperatures for building usage at all times.

Programmable thermostats provide energy savings by reducing heating and cooling energy usage when a room is unoccupied.

4.1.5 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 22 below.

Figure 22 - 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		**0**	**0.0**	**108.3**	**$1,029.80**	**$11,543.23**	**$398.00**	**$11,145.23**	**10.8**	**12,683**
ECM 8	Install High Efficiency Gas Water Heater	0	0.0	97.8	$929.74	$11,500.21	$398.00	$11,102.21	11.9	11,451
ECM 9	Install Low-Flow Domestic Hot Water Devices	0	0.0	10.5	$100.06	$43.02	$0.00	$43.02	0.4	1,232

ECM 8: Install High Efficiency Gas-Fired 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)
0	0.0	97.8	$929.74	$11,500.21	$398.00	$11,102.21	11.9	11,451

Measure Description

We recommend replacing the existing tank water heater with a high efficiency condensing tank water heater. Improvements in combustion efficiency and reductions in heat losses have improved the overall efficiency of storage water heaters. Energy savings results from using less gas to heat water, due to higher unit efficiency, and fewer run hours to maintain the tank water temperature.

ECM 9: 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)
0	0.0	10.5	$100.06	$43.02	$0.00	$43.02	0.4	1,232

Measure Description

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

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

4.1.6 Food Service Equipment & Refrigeration Measures

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

Figure 23 - Summary of Food Service Equipment & Refrigeration ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Food Service Equipment & Refrigeration Measures		**3,695**	**0.2**	**0.0**	**$547.00**	**$2,250.41**	**$100.00**	**$2,150.41**	**3.9**	**3,721**
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	1,919	0.2	0.0	$284.00	$1,213.20	$0.00	$1,213.20	4.3	1,932
ECM 11	Refrigeration Controls	1,777	0.0	0.0	$263.00	$1,037.21	$100.00	$937.21	3.6	1,789

ECM 10: Refrigerator/Freezer Case Electrically Commutated Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,919	0.2	0.0	$284.00	$1,213.20	$0.00	$1,213.20	4.3	1,932

Measure Description

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

ECM 11: Walk-In Cooler And Freezer 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)
1,777	0.0	0.0	$263.00	$1,037.21	$100.00	$937.21	3.6	1,789

Measure Description

We recommend the installation of additional controls to optimize the operation of walk-in coolers and freezers.

Many walk-in coolers and freezers have continuously operating electric heaters on the doors to prevent condensation formation. This measure adds a control system feature to shut off the door heaters when the humidity level is low enough that condensation will not occur if the heaters are off. This is accomplished by measuring the ambient humidity and temperature of the store, comparing that to the dewpoint and using pulse width modulation to control the anti-sweat door heaters.

Defrost controllers can be used to override defrost of evaporator fans when the defrost operation is not necessary, reducing annual energy consumption. This measure is applicable to existing evaporator fans with a traditional electric defrost mechanism.

Many walk-in coolers and freezers have evaporator fans which run continuously. The measure adds a control system feature to automatically shut off evaporator fans when the cooler's thermostat is not calling for cooling.

Energy savings for each of the control measures account for reduction in compressor and fan operating hours as well as reduction in the refrigeration heat load as appropriate.

4.1.7 Plug Load Equipment Control - Vending Machines

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

Figure 24- Summary of Plug Load Equipment ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	*Annual Natural Gas Savings (MMBtu)*	*Annual N/A Savings (MMBtu)*	*Annual N/A Savings (MMBtu)*	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine		**3,566**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**$527.90**	**$690.00**	**$0.00**	**$690.00**	**1.3**	**3,591**
ECM 12	Vending Machine Control	3,566	0.0	0.0	0.0	0.0	0.0	$527.90	$690.00	$0.00	$690.00	1.3	3,591

ECM 12: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
3,566	0.0	0.0	$527.90	$690.00	$0.00	$690.00	1.3	3,591

Measure Description

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

5 ENERGY EFFICIENT PRACTICES

In addition to the quantifiable savings estimated in Section 4, a facility's energy performance can also be improved through application of many low cost or no-cost energy efficiency strategies. By employing certain behavioral and operational changes and performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and energy and O&M costs can be reduced. The recommendations below are provided as a framework for developing a whole building maintenance plan that is customized to your facility. Consult with qualified equipment specialists for details on proper maintenance and system operation.

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.

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.

Perform Routine Motor Maintenance

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

Practice Proper Use of Thermostat Schedules and Temperature Resets

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

Clean Evaporator/Condenser Coils on AC Systems

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

Clean and/or Replace HVAC Filters

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

Check for and Seal Duct Leakage

Duct leakage in commercial buildings typically accounts for 5 to 25 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.

Repair/Replace Steam Traps

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

Perform Proper Boiler Maintenance

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

Perform Proper Water Heater Maintenance

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

Water Conservation

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

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

Refer to Section 4.1.5 for any low-flow ECM recommendations.

6 On-Site Generation Measures

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

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

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

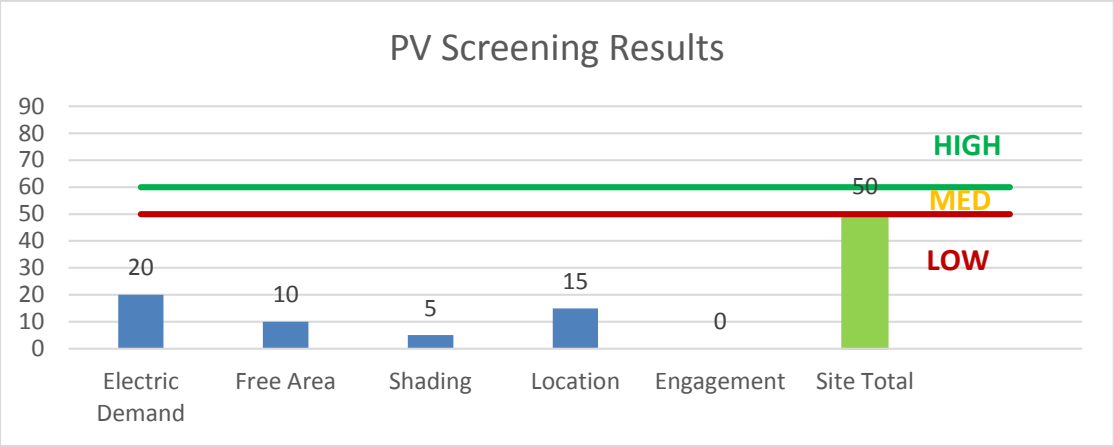
6.1 Photovoltaic

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

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

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

Figure 25 - Photovoltaic Screening



Potential	Medium	
System Potential	54	kW DC STC
Electric Generation	40,632	kWh/yr
Displaced Cost	$3,530	/yr
Installed Cost	$154,400	

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

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

6.2 Combined Heat and Power

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

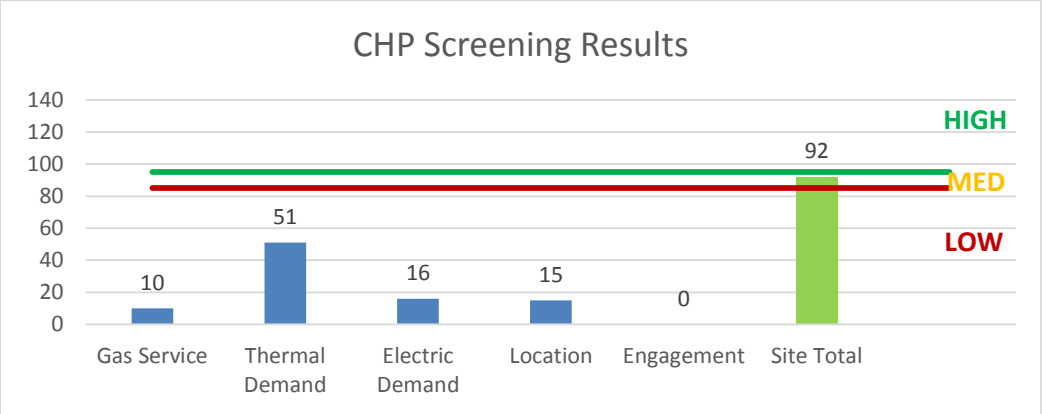
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

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

The magnitude, type, and duration of the thermal demand, the coincident electric load, and the ease of interconnection contribute to the potential for CHP at the site. Based on the amount of steam/hot water used throughout the year and the concurrent electric demand a gas reciprocating engine cell may be feasible. If Wildwood High School & Middle School is interested in pursuing the installation of CHP, we recommended a more detailed feasibility study be conducted.

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

Figure 26 - Combined Heat and Power Screening



Potential	Medium	
System Type	Recip Engine	
System Potential	180	kW
Electric Generation	1,239,350	kWh/yr
Thermal Generation	6,862,458	MBtu/yr
Displaced Cost	$79,414	/yr
Installed Cost	$913,000	

Please see Section 8.3 for additional information in the Combined Heat & Power Program.

7 DEMAND RESPONSE

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

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

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

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

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

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

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

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 27 for a list of the eligible programs identified for each recommended ECM.

Figure 27 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x			x		
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x			x		
ECM 3	Retrofit Fixtures with LED Lamps	x			x		
ECM 4	Install LED Exit Signs	x			x		
ECM 5	Install Occupancy Sensor Lighting Controls	x			x		
ECM 6	Premium Efficiency Motors	x			x		
ECM 7	Install Programmable Thermostats	x			x		
ECM 8	Install High Efficiency Gas Water Heater	x			x		
ECM 9	Install Low-Flow Domestic Hot Water Devices				x		
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	x			x		
ECM 11	Refrigeration Controls	x			x		
ECM 12	Vending Machine Control				x		

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

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

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

8.1 SmartStart

Overview

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

Equipment with Prescriptive Incentives Currently Available:

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

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

Incentives

The SmartStart prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SmartStart program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentive offerings for specific devices.

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

How to Participate

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

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

8.2 Pay for Performance

Overview

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

Incentives

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

How to Participate

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

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

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

8.3 Combined Heat and Power Program

Overview

One of the goals of the State of New Jersey is to enhance energy efficiency through on-site power generation with recovery and productive use of waste heat, and to reduce existing and new demands to the electric power grid. The Combined Heat & Power (CHP) program provides incentives for eligible CHP or Waste Heat to Power (WHP) projects. Eligible CHP or Waste Heat to Power (WHP) projects must achieve an annual system efficiency of at least 65% (Lower Heating Value - LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine Fuel Cells with Heat Recovery	>3 MW	$350		
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, incentive levels, and requirements.

How to Participate

You work with a qualified developer or consulting firm to complete the CHP Application. Once the application is approved the project can be installed. Information about the CHP program can be found at: www.njcleanenergy.com/CHP.

8.4 SREC Registration Program

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

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

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

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

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

8.5 Energy Savings Improvement Program

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

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

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

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

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

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

8.6 Demand Response Energy Aggregator

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

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

See Section 7 for additional information.

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Offices	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.38	3,125	0.0	$462.62	$1,564.67	$195.00	2.96
Rear office	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
vault	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,628	0.02	176	0.0	$26.00	$117.00	$10.00	4.12
superintendent	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
hallway	8	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	8	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.15	1,235	0.0	$182.78	$1,150.67	$160.00	5.42
mens	2	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	2	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.07	554	0.0	$81.93	$107.51	$10.00	1.19
storage	2	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	2	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.07	554	0.0	$81.93	$107.51	$10.00	1.19
womens	4	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	4	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.14	1,107	0.0	$163.87	$215.01	$20.00	1.19
stairs	4	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	4	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.08	617	0.0	$91.39	$575.33	$80.00	5.42
womens locker	3	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	Yes	3	LED - Linear Tubes: (4) 2' Lamps	Occupancy Sensor	34	3,240	0.08	626	0.0	$92.65	$701.50	$95.00	6.55
womens locker	20	Incandescent: screw in	Wall Switch	60	4,628	Relamp	Yes	20	LED Screw-In Lamps: 1 lamp	Occupancy Sensor	8	3,240	0.71	5,791	0.0	$857.17	$1,345.06	$135.00	1.41
storage	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
sports storage	2	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	2	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.07	554	0.0	$81.93	$107.51	$10.00	1.19
equipment	3	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	3	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.10	830	0.0	$122.90	$161.26	$15.00	1.19
storage	3	Incandescent: 2 lamp screw in	Wall Switch	120	4,628	Relamp	No	3	LED Screw-In Lamps: 2 lamp	Wall Switch	8	4,628	0.22	1,788	0.0	$264.71	$322.52	$30.00	1.11
gym	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	No	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,628	0.37	2,980	0.0	$441.19	$1,618.33	$200.00	3.21
gym	24	Metal Halide: (1) 400W Lamp	Wall Switch	458	4,628	Fixture Replacement	No	24	LED - Fixtures: High-Bay	Wall Switch	150	4,628	4.85	39,342	0.0	$5,823.68	$64,444.80	$3,600.00	10.45
gym	4	Exit Signs: Fluorescent	Wall Switch	18	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.03	484	0.0	$71.58	$430.22	$0.00	6.01
gym storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,628	0.02	176	0.0	$26.00	$117.00	$10.00	4.12
gym office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
boys locker	13	Incandescent: screw in	Wall Switch	60	4,628	Relamp	Yes	13	LED Screw-In Lamps: 1 lamp	Occupancy Sensor	8	3,240	0.46	3,764	0.0	$557.16	$968.79	$100.00	1.56
boys locker	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.22	1,775	0.0	$262.82	$1,206.00	$115.00	4.15
phys ed office	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,628	0.04	298	0.0	$44.12	$161.83	$20.00	3.21
bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,628	0.02	176	0.0	$26.00	$117.00	$10.00	4.12
storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,628	0.02	176	0.0	$26.00	$117.00	$10.00	4.12

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
stairs	3	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	3	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.10	830	0.0	$122.90	$161.26	$15.00	1.19
football storage	2	Incandescent: screw in	Wall Switch	24	4,628	Relamp	No	2	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.02	170	0.0	$25.21	$107.51	$10.00	3.87
basketball	2	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	2	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.07	554	0.0	$81.93	$107.51	$10.00	1.19
weights	10	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	10	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.34	2,768	0.0	$409.67	$537.53	$50.00	1.19
weights	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.19	1,554	0.0	$229.97	$1,089.00	$105.00	4.28
weights	3	LED Screw-In Lamps: a19	Wall Switch	8	4,628	None	No	3	LED Screw-In Lamps: a19	Wall Switch	8	4,628	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Offices	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
Offices	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,628	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,628	0.01	85	0.0	$12.61	$107.00	$10.00	7.70
custodial closst	2	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	2	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.07	554	0.0	$81.93	$107.51	$10.00	1.19
cross country	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
cross country	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
stairs	3	Incandescent: 3 lamp screw in	Wall Switch	180	4,628	Relamp	No	3	LED Screw-In Lamps: 3 lamp	Wall Switch	8	4,628	0.34	2,746	0.0	$406.52	$483.78	$45.00	1.08
hallway	2	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	2	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.07	554	0.0	$81.93	$107.51	$10.00	1.19
hallway	13	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	13	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.25	2,006	0.0	$297.01	$1,869.83	$260.00	5.42
IT room	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
maintenance	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.24	1,953	0.0	$289.14	$1,079.17	$135.00	3.27
hallway	5	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	5	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.10	772	0.0	$114.24	$719.17	$100.00	5.42
mens	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
resource office	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
resource office	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
women	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
107	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
107A	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
library	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.87	7,102	0.0	$1,051.29	$4,014.00	$355.00	3.48
offices	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.11	888	0.0	$131.41	$738.00	$75.00	5.05

	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
Conference	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.11	888	0.0	$131.41	$738.00	$75.00	5.05
office 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.11	888	0.0	$131.41	$738.00	$75.00	5.05
library entrance	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
server room	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
entrance	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,628	0.09	703	0.0	$103.99	$468.00	$40.00	4.12
hallway	17	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	17	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.32	2,624	0.0	$388.40	$2,445.17	$340.00	5.42
nurse	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.08	666	0.0	$98.56	$621.00	$65.00	5.64
nurse	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.05	444	0.0	$65.71	$504.00	$55.00	6.83
nurse	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.05	444	0.0	$65.71	$504.00	$55.00	6.83
bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.03	222	0.0	$32.85	$387.00	$45.00	10.41
bathroom	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
106	40	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	40	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	1.09	8,877	0.0	$1,314.11	$4,950.00	$435.00	3.44
display	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.05	444	0.0	$65.71	$504.00	$55.00	6.83
storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.11	888	0.0	$131.41	$738.00	$75.00	5.05
hallway	5	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	5	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.10	772	0.0	$114.24	$719.17	$100.00	5.42
cafeteria	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.66	5,326	0.0	$788.47	$3,078.00	$275.00	3.56
elevator	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.03	222	0.0	$32.85	$387.00	$45.00	10.41
pantry	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.05	444	0.0	$65.71	$504.00	$55.00	6.83
Kitchen	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.66	5,326	0.0	$788.47	$3,078.00	$275.00	3.56
dishes	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
pantry	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
stock room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.05	444	0.0	$65.71	$504.00	$55.00	6.83
cafeteria office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.05	444	0.0	$65.71	$504.00	$55.00	6.83
boiler room	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
boiler room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.14	1,110	0.0	$164.26	$855.00	$85.00	4.69

	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
storage room	2	Compact Fluorescent: Twin Tube 26W	Wall Switch	26	4,628	None	No	2	Compact Fluorescent: Twin Tube 26W	Wall Switch	26	4,628	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
storage room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.03	222	0.0	$32.85	$387.00	$45.00	10.41
111	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.58	4,688	0.0	$693.93	$2,212.00	$275.00	2.79
back stage	8	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	4,628	Relamp & Reballast	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,628	0.16	1,320	0.0	$195.38	$936.00	$80.00	4.38
auditorium	16	Metal Halide: (1) 250W Lamp	Wall Switch	295	4,628	Fixture Replacement	No	16	LED - Fixtures: High-Bay	Wall Switch	70	4,628	2.36	19,160	0.0	$2,836.21	$42,963.20	$2,400.00	14.30
auditorium	33	Halogen Incandescent: 150 W Screw IN	Wall Switch	150	4,628	Relamp	No	33	LED Screw-In Lamps: 1 lamp	Wall Switch	4	4,628	3.16	25,642	0.0	$3,795.79	$1,773.85	$165.00	0.42
110	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,628	Relamp & Reballast	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,240	0.33	2,663	0.0	$394.23	$1,322.00	$155.00	2.96
110 rear	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,628	Relamp & Reballast	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,240	0.12	999	0.0	$147.84	$664.50	$80.00	3.95
113	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.05	444	0.0	$65.71	$504.00	$55.00	6.83
hallway	10	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	10	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.19	1,543	0.0	$228.47	$1,438.33	$200.00	5.42
halllway	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,628	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,628	0.01	85	0.0	$12.61	$107.00	$10.00	7.70
114	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
Bathroom	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
106	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.11	888	0.0	$131.41	$738.00	$75.00	5.05
teachers lounge	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
teachers lounge	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,628	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,628	0.01	85	0.0	$12.61	$107.00	$10.00	7.70
stairs	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
entrance	10	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,628	Relamp & Reballast	Yes	10	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,240	0.14	1,123	0.0	$166.23	$1,340.00	$135.00	7.25
trophy display	8	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	4,628	Relamp & Reballast	Yes	8	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	3,240	0.08	683	0.0	$101.16	$1,018.00	$75.00	9.32
teachers room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.05	444	0.0	$65.71	$504.00	$55.00	6.83
bathroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,240	0.01	112	0.0	$16.62	$377.00	$45.00	19.97
mens bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.05	444	0.0	$65.71	$504.00	$55.00	6.83
101	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
hallway	15	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	15	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.29	2,315	0.0	$342.71	$2,157.50	$300.00	5.42
102 storage	2	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	2	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.07	554	0.0	$81.93	$107.51	$10.00	1.19

	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
102 storage	1	Compact Fluorescent: screw in CFL	Wall Switch	13	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.00	27	0.0	$3.94	$53.75	$5.00	12.38
102 storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
103	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.58	4,688	0.0	$693.93	$2,212.00	$275.00	2.79
104	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
105A	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
105B	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.24	1,953	0.0	$289.14	$1,079.17	$135.00	3.27
306A	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
306	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
305	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
319	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.53	4,297	0.0	$636.10	$2,050.17	$255.00	2.82
hallway	15	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	15	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.29	2,315	0.0	$342.71	$2,157.50	$300.00	5.42
304	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
318	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
318A	2	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	2	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.07	554	0.0	$81.93	$107.51	$10.00	1.19
303B	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,240	0.03	207	0.0	$30.65	$387.00	$35.00	11.49
303B	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
303	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
303C	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
302	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
301	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.58	4,688	0.0	$693.93	$2,212.00	$275.00	2.79
317	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
hallway	6	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	6	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.11	926	0.0	$137.08	$863.00	$120.00	5.42
roof access	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,628	0.02	176	0.0	$26.00	$117.00	$10.00	4.12
316	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
storage records	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.33	2,663	0.0	$394.23	$1,674.00	$155.00	3.85

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
storage records	4	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	4	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.14	1,107	0.0	$163.87	$215.01	$20.00	1.19
315	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
314	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
hallway	15	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	15	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.29	2,315	0.0	$342.71	$2,157.50	$300.00	5.42
313B	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.24	1,953	0.0	$289.14	$1,079.17	$135.00	3.27
313A	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
312B	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
312A	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
girls	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,240	0.03	207	0.0	$30.65	$387.00	$35.00	11.49
girls	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
311	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
320	24	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	24	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	1.15	9,376	0.0	$1,387.85	$4,154.00	$515.00	2.62
office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
3210	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.72	5,860	0.0	$867.41	$2,697.50	$335.00	2.72
closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
309	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
309A	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
book Closet A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.03	222	0.0	$32.85	$387.00	$45.00	10.41
308	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
307	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
hallway	6	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	6	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.11	926	0.0	$137.08	$863.00	$120.00	5.42
book closet B	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.03	222	0.0	$32.85	$387.00	$45.00	10.41
stairwell 4	3	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	3	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.10	830	0.0	$122.90	$161.26	$15.00	1.19
stairwell 4	1	Incandescent: 3 lamp screw in	Wall Switch	180	4,628	Relamp	No	1	LED Screw-In Lamps: 3 lamp	Wall Switch	8	4,628	0.11	915	0.0	$135.51	$161.26	$15.00	1.08
206A	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48

	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
206	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.16	1,332	0.0	$197.12	$972.00	$95.00	4.45
closet	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
205	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
204	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.58	4,688	0.0	$693.93	$2,212.00	$275.00	2.79
hallway	15	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	15	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.29	2,315	0.0	$342.71	$2,157.50	$300.00	5.42
mens bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,240	0.03	207	0.0	$30.65	$387.00	$35.00	11.49
mens bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
womens	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,240	0.03	207	0.0	$30.65	$387.00	$35.00	11.49
womens	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
203B	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
203A	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
storage records	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
202	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
hallway	6	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	4,628	Relamp & Reballast	No	6	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,628	0.11	926	0.0	$137.08	$863.00	$120.00	5.42
201	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
athletic director	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
VP	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.14	1,172	0.0	$173.48	$755.50	$95.00	3.81
VP secretary	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
main office	22	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	22	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	1.06	8,594	0.0	$1,272.20	$3,830.33	$475.00	2.64
office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.19	1,563	0.0	$231.31	$917.33	$115.00	3.47
MS. Shaw	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
principal	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
bathroom	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
control room	4	Incandescent: BR20	Wall Switch	60	4,628	Relamp	Yes	4	LED Screw-In Lamps: BR20	Occupancy Sensor	8	3,240	0.14	1,158	0.0	$171.43	$524.21	$55.00	2.74

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
214	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.03	222	0.0	$32.85	$387.00	$45.00	10.41
hallway	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	No	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,628	0.32	2,634	0.0	$389.98	$1,755.00	$150.00	4.12
213	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
storage supplies	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.03	222	0.0	$32.85	$387.00	$45.00	10.41
teachers supplies	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.03	222	0.0	$32.85	$387.00	$45.00	10.41
212	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
211A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,240	0.03	222	0.0	$32.85	$387.00	$45.00	10.41
211	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
closet	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
210	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
210	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
209	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.29	2,344	0.0	$346.96	$1,241.00	$155.00	3.13
209	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
208A	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.10	781	0.0	$115.65	$593.67	$75.00	4.48
IT office	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
child study office	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
child study office	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.14	1,172	0.0	$173.48	$755.50	$95.00	3.81
child study office	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
child study office	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
child study office	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.05	391	0.0	$57.83	$431.83	$55.00	6.52
207	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,628	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,240	0.43	3,516	0.0	$520.44	$1,726.50	$215.00	2.90
207	1	Incandescent: screw in	Wall Switch	60	4,628	Relamp	No	1	LED Screw-In Lamps: 1 lamp	Wall Switch	8	4,628	0.03	277	0.0	$40.97	$53.75	$5.00	1.19
exterior	3	High-Pressure Sodium: (1) 100W Lamp	None	138	4,628	Fixture Replacement	No	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	30	4,628	0.21	1,724	0.0	$255.26	$1,172.03	$300.00	3.42
exterior	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	45	4,628	None	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	45	4,628	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Stairs 1,2,3,4	Stairs 1,2,3,4	4	Supply Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
team locker room, 111, 124,214	team locker room, 111, 124,214	3	Supply Fan	0.3	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gym	Gym	2	Supply Fan	0.5	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gym	Gym	2	Supply Fan	0.3	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
corridor 107	corridor 107	2	Supply Fan	0.1	65.0%	no	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
corridor 107	corridor 107	1	Supply Fan	0.2	65.0%	no	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
lobby 100	lobby 100	1	Supply Fan	0.2	65.0%	no	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
roof	gym hallways rooms	1	Exhaust Fan	2.0	75.0%	NO	2,745	Yes	86.5%	No		0.15	544	0.0	$80.60	$894.24	$0.00	11.09
roof	gym hallways rooms	2	Exhaust Fan	1.0	75.0%	NO	2,745	Yes	85.5%	No		0.14	503	0.0	$74.45	$1,493.46	$0.00	20.06
roof	gym hallways rooms	2	Exhaust Fan	0.2	75.0%	NO	2,745	No	75.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
roof	gym hallways rooms	1	Exhaust Fan	0.5	75.0%	NO	2,745	No	75.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
sides of gym	sides of gym	3	Supply Fan	2.0	83.0%	no	2,745	No	83.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen, auditorium	kitchen auditorium	3	Supply Fan	2.0	83.0%	No	2,745	No	83.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen, auditorium	kitchen auditorium	3	Return Fan	1.0	83.0%	no	2,745	No	83.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
ground, first 2nd floors	classrooms	17	Supply Fan	0.3	65.0%	NO	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
mechanical room	additions	1	Heating Hot Water Pump	3.0	90.2%	No	2,745	No	90.2%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	additions	1	Heating Hot Water Pump	3.0	80.5%	No	2,745	Yes	89.5%	No		0.16	576	0.0	$85.20	$804.84	$0.00	9.45
Mechanical Room	hx to addtion	1	Heating Hot Water Pump	3.0	80.5%	No	2,745	Yes	89.5%	No		0.16	576	0.0	$85.20	$804.84	$0.00	9.45
mechanical room	compressor Honeywell controls	1	Air Compressor	0.5	65.0%	NO	4,957	No	65.0%	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
Classrooms	classrooms	14	Window AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
roof	auditorium/cafeteria	2	Split-System AC	20.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	auditorium/cafeteria	1	Split-System AC	25.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
roof	auditorium/cafeteria	2	Split-System AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	labs	1	Split-System AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	labs classrooms	2	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
side of builidng	labs	1	Split-System AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	whole building	2	Induced Draft Steam Boiler	1,880.00	Yes	2	Forced Draft Steam Boiler	1,880.00	81.00%	Et	0.00	0	237.7	$2,259.42	$94,952.87	$4,512.00	40.03

Programmable Thermostat Recommendations

		Recommendation Inputs				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	Thermostat Quantity	Cooling Capacity of Controlled System (Tons)	Electric Heating Capacity of Controlled System (kBtu/hr)	Output Heating Capacity of Controlled System (MBh)	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
offices, labs	offices labs	5	18.00	0.00		0.00	1,287	0.0	$190.50	$1,649.35	$0.00	8.66

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
mechanical room	addition	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
mechanical room 2	original building	1	Storage Tank Water Heater (> 50 Gal)	Yes	1	Storage Tank Water Heater (> 50 Gal)	Natural Gas	92.00%	Et	0.00	0	97.8	$929.74	$11,500.21	$398.00	11.94

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
addition bathrooms, faculty bathrooms	6	Faucet Aerator (Lavatory)	2.20	1.00	0.00	0	10.5	$100.06	$43.02	$0.00	0.43

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)	Yes	Yes	No	0.12	1,848	0.0	$273.50	$1,125.20	$50.00	3.93
Kitchen	1	Cooler (35F to 55F)	Yes	Yes	No	0.12	1,848	0.0	$273.50	$1,125.20	$50.00	3.93

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	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Cooking Equipment Inventory & Recommendations

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

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
offices, labs, classrooms	150	computers	200.0	No
offices	5	copiers	350.0	No
home ec teachers lounge	3	microwaves	800.0	No

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
teachers lounge	2	Refrigerated	Yes	0.00	3,224	0.0	$477.20	$460.00	$0.00	0.96
teachers lounge	1	Non-Refrigerated	Yes	0.00	343	0.0	$50.70	$230.00	$0.00	4.54

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Wildwood High School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 128,170
Built: 1926

For Year Ending: October 31, 2016
Date Generated: April 18, 2017

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Wildwood High School 4300 Pacific Avenue Wildwood, New Jersey 08260	_____ , (___)___-____	Ignacio Badilla 1430 Broadway 10th Floor New York, NY 10018 2015721187 ibadilla@trcsolutions.com

Property ID: 5853539

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
60.9 kBtu/ft²

Source EUI
107.4 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	2,662,710 (34%)
Natural Gas (kBtu)	5,147,012 (66%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	71.2
National Median Source EUI (kBtu/ft²)	125.5
% Diff from National Median Source EUI	-14%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	579

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)