



# Local Government Energy Audit: Energy Audit Report



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*Lacey Township Middle School*

Lacey Township Board of Education

660 Denton Avenue

Forked River, NJ 08731

March 16, 2018

Final Report by:

**TRC Energy Services**

## Disclaimer

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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.

# Table of Contents

---

<b>1</b>	<b>Executive Summary.....</b>	<b>1</b>
1.1	Facility Summary .....	1
1.2	Your Cost Reduction Opportunities.....	1
	Energy Conservation Measures.....	1
	Energy Efficient Practices .....	3
	On-Site Generation Measures.....	3
1.3	Implementation Planning.....	4
<b>2</b>	<b>Facility Information and Existing Conditions .....</b>	<b>5</b>
2.1	Project Contacts .....	5
2.2	General Site Information.....	5
2.3	Building Occupancy .....	5
2.4	Building Envelope .....	5
2.5	On-Site Generation.....	6
2.6	Energy-Using Systems .....	6
	Lighting System .....	6
	Hot Water Heating System.....	6
	Direct Expansion Air Conditioning System (DX) .....	6
	Domestic Hot Water Heating System.....	6
	Food Service .....	7
	Refrigeration .....	7
	Building Plug Load .....	7
2.7	Water-Using Systems .....	7
<b>3</b>	<b>Site Energy Use and Costs.....</b>	<b>8</b>
3.1	Total Cost of Energy .....	8
3.2	Electricity Usage .....	9
3.3	Natural Gas Usage .....	10
3.4	Benchmarking.....	11
3.5	Energy End-Use Breakdown .....	12
<b>4</b>	<b>Energy Conservation Measures .....</b>	<b>13</b>
4.1	Recommended ECMs .....	13
4.1.1	Lighting Upgrades.....	14
	ECM 1: Install LED Fixtures .....	14
	ECM 2: Retrofit Fixtures with LED Lamps .....	14
4.1.2	Lighting Control Measures .....	15
	ECM 3: Install Occupancy Sensor Lighting Controls .....	15
	ECM 4: Install High/Low Lighting Controls .....	16
4.1.3	Variable Frequency Drive Measures .....	16
	ECM 5: Install VFDs on Constant Volume (CV) HVAC .....	17
	ECM 6: Install VFDs on Hot Water Pumps.....	17

4.1.4	Domestic Hot Water Heating System Upgrades .....	18
	ECM 7: Install Low-Flow DHW Devices.....	18
4.1.5	Plug Load Equipment Control - Vending Machines.....	19
	ECM 8: Vending Machine Control .....	19
<b>5</b>	<b>Energy Efficient Practices .....</b>	<b>20</b>
	Reduce Air Leakage .....	20
	Close Doors and Windows .....	20
	Use Window Treatments/Coverings .....	20
	Perform Proper Lighting Maintenance.....	20
	Develop a Lighting Maintenance Schedule .....	20
	Perform Routine Motor Maintenance .....	21
	Practice Proper Use of Thermostat Schedules and Temperature Resets .....	21
	Clean Evaporator/Condenser Coils on AC Systems .....	21
	Clean and/or Replace HVAC Filters .....	21
	Check for and Seal Duct Leakage .....	21
	Perform Proper Boiler Maintenance .....	21
	Perform Proper Water Heater Maintenance .....	22
	Plug Load Controls.....	22
	Replace Computer Monitors .....	22
	Water Conservation .....	22
<b>6</b>	<b>On-Site Generation Measures .....</b>	<b>23</b>
6.1	Photovoltaic.....	23
6.2	Combined Heat and Power .....	24
<b>7</b>	<b>Demand Response .....</b>	<b>26</b>
<b>8</b>	<b>Project Funding / Incentives .....</b>	<b>27</b>
8.1	SmartStart .....	28
8.2	SREC Registration Program.....	29
8.3	Energy Savings Improvement Program .....	29
8.4	Demand Response Energy Aggregator.....	30
<b>9</b>	<b>Energy Purchasing and Procurement Strategies .....</b>	<b>31</b>
9.1	Retail Electric Supply Options.....	31
9.2	Retail Natural Gas Supply Options .....	31

Appendix A: Equipment Inventory & Recommendations

Appendix B: ENERGY STAR® Statement of Energy Performance

# Table of Figures

---

Figure 1 – Previous 12 Month Utility Costs..... 2

Figure 2 – Potential Post-Implementation Costs ..... 2

Figure 3 – Summary of Energy Reduction Opportunities ..... 2

Figure 4 – Project Contacts ..... 5

Figure 5 - Building Schedule..... 5

Figure 6 - Utility Summary ..... 8

Figure 7 - Energy Cost Breakdown ..... 8

Figure 8 -Electric Usage & Demand ..... 9

Figure 9 -Electric Usage & Demand ..... 9

Figure 10 -Natural Gas Usage ..... 10

Figure 11 -Natural Gas Usage ..... 10

Figure 12 - Energy Use Intensity Comparison – Existing Conditions..... 11

Figure 13 - Energy Use Intensity Comparison – Following Installation of Recommended Measures ..... 11

Figure 14 - Energy Balance (kBtu/SF, %) ..... 12

Figure 15 – Summary of Recommended ECMs..... 13

Figure 16 – Summary of Lighting Upgrade ECMs..... 14

Figure 17 – Summary of Lighting Control ECMs ..... 15

Figure 18 – Summary of Variable Frequency Drive ECMs ..... 16

Figure 19 - Summary of Domestic Water Heating ECMs ..... 18

Figure 20 - Photovoltaic Screening ..... 23

Figure 21 - Combined Heat and Power Screening ..... 25

Figure 22 - ECM Incentive Program Eligibility..... 27

# I EXECUTIVE SUMMARY

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The New Jersey Board of Public Utilities (NJBP) has sponsored this Local Government Energy Audit (LGEA) Report for Lacey Township 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, as part of a comprehensive effort to assist the Lacey Township Board of Education in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

## I.1 Facility Summary

Lacey Township Middle School is a 105,355 square foot facility comprised of a two-story public school building that provides educational services at the middle school level, serving grades 7 and 8. The building was constructed in 1998.

Lighting at Lacey Township Middle School consists primarily of T8 fluorescent sources, which are inefficient compared to currently available alternatives. Cooling and ventilation are provided by a combination of packaged rooftop air conditioning units and split system air conditioning units. These units are from the original building construction and close to retirement age at 19 years. Most of classroom heating is provided by local unit ventilators. Heat for larger spaces, including the gymnasium and cafeteria, is provided by the rooftop package units, some of which provide heating only. Heating hot water is generated by two original 5,400 MBh boilers and distributed to the fans through a hot water circulating loop. Building systems are monitored and controlled by a building management system. The facility is equipped with rooftop mounted solar photovoltaic panels that can generate up to 210 kW. A thorough description of the facility and our observations are located in Section 2.

## I.2 Your Cost Reduction Opportunities

### Energy Conservation Measures

TRC evaluated eight (8) measures which together represent an opportunity for Lacey Township Middle School to reduce annual energy costs by roughly \$26,698 and annual greenhouse gas emissions by 271,816 lbs CO<sub>2</sub>e. We estimate that if all measures were implemented as recommended, the project would pay for itself in roughly 7.6 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 Lacey Township Middle School's annual energy use by 12%.

Figure 1 – Previous 12 Month Utility Costs

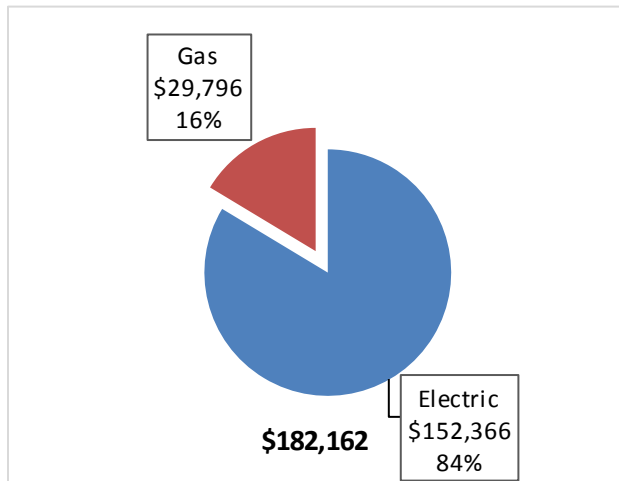
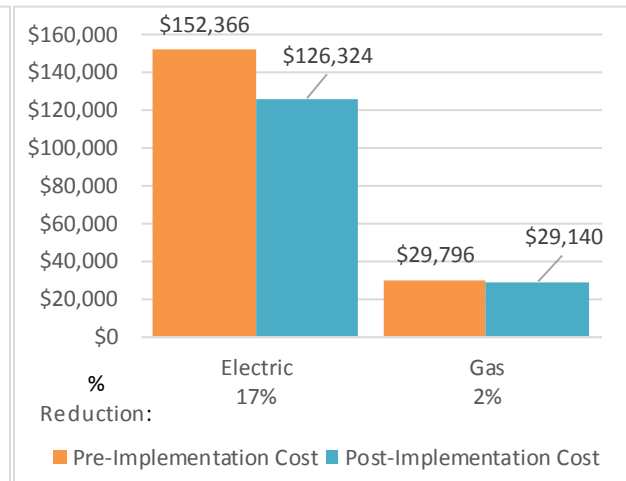


Figure 2 – Potential Post-Implementation Costs



A detailed description of Lacey Township 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 Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)	
<b>Lighting Upgrades</b>		<b>156,808</b>	<b>43.5</b>	<b>0.0</b>	<b>\$15,548.43</b>	<b>\$183,373.89</b>	<b>\$18,110.00</b>	<b>\$165,263.89</b>	<b>10.6</b>	<b>157,904</b>	
ECM 1	Install LED Fixtures	Yes	53,530	12.4	0.0	\$5,307.86	\$102,564.60	\$2,935.00	\$99,629.60	18.8	53,905
ECM 2	Retrofit Fixtures with LED Lamps	Yes	103,277	31.2	0.0	\$10,240.57	\$80,809.29	\$15,175.00	\$65,634.29	6.4	103,999
<b>Lighting Control Measures</b>		<b>32,432</b>	<b>9.8</b>	<b>0.0</b>	<b>\$3,215.83</b>	<b>\$22,232.00</b>	<b>\$2,680.00</b>	<b>\$19,552.00</b>	<b>6.1</b>	<b>32,659</b>	
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	30,017	9.1	0.0	\$2,976.35	\$19,832.00	\$2,680.00	\$17,152.00	5.8	30,227
ECM 4	Install High/Low Lighting Controls	Yes	2,415	0.7	0.0	\$239.48	\$2,400.00	\$0.00	\$2,400.00	10.0	2,432
<b>Variable Frequency Drive (VFD) Measures</b>		<b>69,491</b>	<b>9.5</b>	<b>0.0</b>	<b>\$6,890.44</b>	<b>\$17,863.05</b>	<b>\$1,200.00</b>	<b>\$16,663.05</b>	<b>2.4</b>	<b>69,977</b>	
ECM 5	Install VFDs on Constant Volume (CV) HVAC	Yes	16,682	4.4	0.0	\$1,654.09	\$5,194.45	\$1,200.00	\$3,994.45	2.4	16,798
ECM 6	Install VFDs on Hot Water Pumps	Yes	52,809	5.1	0.0	\$5,236.35	\$12,668.60	\$0.00	\$12,668.60	2.4	53,178
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>62.7</b>	<b>\$655.93</b>	<b>\$365.67</b>	<b>\$0.00</b>	<b>\$365.67</b>	<b>0.6</b>	<b>7,341</b>	
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	62.7	\$655.93	\$365.67	\$0.00	\$365.67	0.6	7,341
<b>Plug Load Equipment Control - Vending Machine</b>		<b>3,909</b>	<b>0.0</b>	<b>0.0</b>	<b>\$387.57</b>	<b>\$920.00</b>	<b>\$0.00</b>	<b>\$920.00</b>	<b>2.4</b>	<b>3,936</b>	
ECM 8	Vending Machine Control	Yes	3,909	0.0	0.0	\$387.57	\$920.00	\$0.00	\$920.00	2.4	3,936
<b>TOTALS</b>		<b>262,639</b>	<b>62.8</b>	<b>62.7</b>	<b>\$26,698.20</b>	<b>\$224,754.61</b>	<b>\$21,990.00</b>	<b>\$202,764.61</b>	<b>7.6</b>	<b>271,816</b>	

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

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

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

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

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

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

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

### **Energy Efficient Practices**

TRC also identified 15 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 Lacey Township Middle School include:

- Reduce Air Leakage
- Close Doors and Windows
- Use Window Treatments/Coverings
- 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
- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Install Plug Load Controls
- Replace Computer Monitors
- 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 Lacey Township Middle School. The site already has a 210 kW photovoltaic (PV) array that supplies electricity to the school. Based on the configuration of the site and its loads there is a low potential for installing additional PV or any combined heat and power self-generation measures. For details on our evaluation and on-site generation potential, please refer to Section 6.



### I.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

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.

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 8.3 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](http://www.njcleanenergy.com/ci).

## 2 FACILITY INFORMATION AND EXISTING CONDITIONS

### 2.1 Project Contacts

Figure 4 – Project Contacts

Name	Role	E-Mail	Phone #
<b>Customer</b>			
Patrick S. DeGeorge	Business Administrator	pdegeorge@laceyschools.org	(609) 971-2000 x 1001
<b>Designated Representative</b>			
David Klink			
<b>TRC Energy Services</b>			
Smruti Srinivasan	Auditor	SSrinivasan@trcsolutions.com	(732) 855-0033

### 2.2 General Site Information

On March 22, 2017, TRC Energy Services performed an energy audit at Lacey Township Middle School located in Forked River, New Jersey. TRC’s team met with David Klink to review the facility operations and help focus our investigation on specific energy-using systems.

Lacey Township Middle School is a 105,355 square foot facility comprised of a two-story public school building serving grades 7 and 8. The building was constructed in 1998.

### 2.3 Building Occupancy

The school building is open Monday through Friday from approximately 6:45 AM through 2:00 PM during the school year, September through June. Sports activities occur on weekends, but no classes are held. During a typical day, the facility is occupied by a total of approximately 753 staff and students.

Figure 5 - Building Schedule

Building Occupancy Schedule		
Building Name	Weekday/Weekend	Operating Schedule
Lacey Township Middle School	Weekday	6:45 AM - 2:00 PM
Lacey Township Middle School	Weekend	not occupied

### 2.4 Building Envelope

Lacey Township Middle School is a single two-story building. The construction is concrete masonry blocks with brick façade and double pane windows. The flat roof is constructed of built-up roofing material. Photovoltaic solar panels cover a significant portion of the roof.



## 2.5 On-Site Generation

As part of a 2009 district-wide effort, Lacey Township Middle School installed a 210 kW solar energy project consisting of rooftop mounted photovoltaic panels. The array was sized to displace a portion of the site's electric use. Solar production does not exceed the building usage however, therefore additional solar capacity could be installed.

## 2.6 Energy-Using Systems

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

### Lighting System

Interior lighting is provided mostly by fixtures containing relatively inefficient 32-Watt linear fluorescent T8 lamps and electronic ballasts. Fixtures containing compact fluorescent lamps also provide lighting for many areas, including portions of the cafeteria and hallways. Building exit signs use LED sources. Interior lighting control is provided primarily by manually operated switches, although occupancy sensors are used in a few restrooms.

Exterior lighting consists primarily of pole mounted metal halide parking fixtures and wall pack fixtures controlled to operate only during non-daylight hours. Compact fluorescent fixtures provide illumination over the doorways. Several LED fixtures have been installed on the building exterior.

### Hot Water Heating System

The heating hot water system consists of two (2) HB Smith forced draft Model 4500A-15 boilers, rated at 5,400 MBh output. The boilers have a nominal combustion efficiency of 81%. The boilers provide heating hot water throughout the building via two 20 hp pumps. Hot water is provided to fan powered perimeter convection heaters serving classrooms, and to rooftop mounted air handling units which provide heat to larger spaces, including the gymnasium, media center, and cafeteria. The boilers are original equipment (1998) and remain in operational condition.

### Direct Expansion Air Conditioning System (DX)

Space cooling is provided to 90% of the building, including to most classrooms and common support areas. Cooling and ventilation are provided by a mixture of packaged rooftop air conditioning units (RTUs) and split system air conditioning units. Cooling is provided to major support areas, including the office areas, media center, and cafeteria by ten (10) RTUs with capacities that range from 5 to 40 tons. Split system air conditioning units, with capacities ranging between 1 and 5 tons, serve classrooms and some offices. The systems are largely original to the building, 19 years, and are approaching their end of useful life.

The HVAC systems are controlled by the building Energy Management System (EMS) which schedules and optimizes cooling systems based on control algorithms and control inputs including zone and outside air temperature sensor readings.

### Domestic Hot Water Heating System

The domestic hot water heating system consists mainly of an AO Smith BTR 400A 118 gas fired 100 gallon storage tank water heater with an input rating of 390 kBtu/hr. A small circulating pump provides domestic hot water throughout the building. An auxiliary domestic hot water heater with an input rating of 40 kBtu/hr helps meet the load.

## **Food Service**

The school has an all-electric warming kitchen. Food warming equipment consists of four full sized convection ovens, four insulated food holding cabinets, and a milk steamer. The kitchen also contains a Hobart Model CRS-66 door type dishwasher with electric booster heater.

## **Refrigeration**

The facility has two cold storage areas, a walk-in cooler box and a walk-in freezer. Both the cooler and freezer have two evaporators each. The facility also has a reach in milk cooler, ice cream freezer, refrigerator, and several stand up commercial refrigerators.

## **Building Plug Load**

There are roughly 196 computer work stations throughout the facility, the majority with LCD monitors. Classroom areas are equipped with smart boards and projectors. Additional plug load includes several copiers, printers, and other office equipment. Coffee machines, refrigerators, microwaves, and toasters are located throughout the premises and available for staff use. The Café and faculty room have refrigerated beverage and non-refrigerated vending machines.

## **2.7 Water-Using Systems**

There are several faculty and student restrooms at this facility. A sampling of restrooms found that the faucets are rated for 2.5 gallons per minute (gpm) or higher. Additionally there are kitchen sink fixtures located in some classrooms and lounges. Replacement of sink aerators with low flow devices is recommended.

### 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 3.4 for additional information.

#### 3.1 Total Cost of Energy

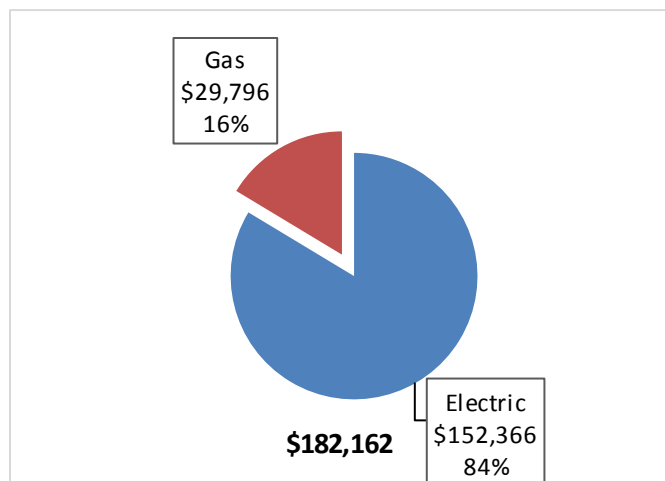
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

*Figure 6 - Utility Summary*

Utility Summary for Lacey Township Middle School		
Fuel	Usage	Cost
Electricity	1,536,633 kWh	\$152,366
Natural Gas	28,479 Therms	\$29,796
<b>Total</b>		<b>\$182,162</b>

The current annual energy cost for this facility is \$182,162 as shown in the chart below.

*Figure 7 - Energy Cost Breakdown*



### 3.2 Electricity Usage

Electricity is provided by JCP&L. The average electric cost over the past 12 months was \$0.099/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. Solar production accounts for about 14% of the facility total electricity use. Costs are not tabulated for the energy produced by the solar panels, which, brings down the site’s overall cost of electricity.

The monthly electricity consumption and peak demand are shown in the chart below. The summer electricity use is comparable to the September use which is high for a site that does not have summer school. The use profile indicates that lighting and HVAC equipment are operating during summer vacation.

Figure 8 -Electric Usage & Demand

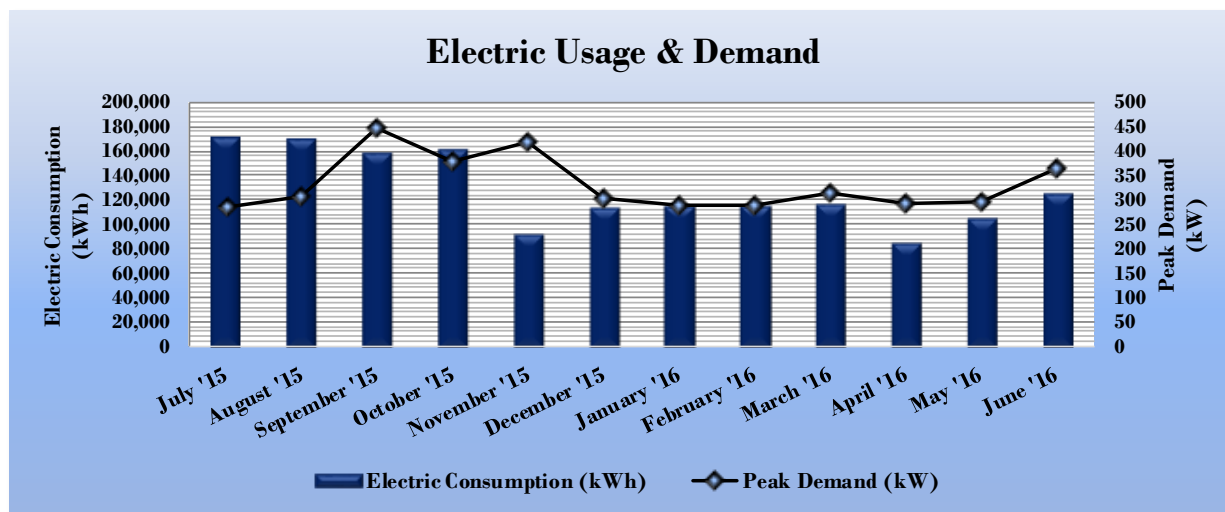


Figure 9 -Electric Usage & Demand

Summary Electric Billing Data for Lacey Township Middle School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
7/24/15	30	171,442	284	\$1,707	\$15,339
8/25/15	32	169,941	305	\$1,839	\$15,197
9/24/15	30	158,759	447	\$2,688	\$15,811
10/24/15	30	161,207	377	\$2,116	\$15,926
11/24/15	31	92,716	419	\$2,349	\$10,128
12/23/15	29	114,407	302	\$1,692	\$12,019
1/26/16	34	115,350	290	\$1,629	\$11,799
2/23/16	28	115,634	288	\$1,613	\$11,627
3/24/16	30	116,980	314	\$1,759	\$11,969
4/22/16	29	85,566	291	\$1,631	\$8,822
5/20/16	28	105,036	296	\$1,661	\$10,167
6/22/16	33	125,385	366	\$2,197	\$13,145
<b>Totals</b>	<b>364</b>	<b>1,532,423</b>	<b>447</b>	<b>\$22,881</b>	<b>\$151,949</b>
<b>Annual</b>	<b>365</b>	<b>1,536,633</b>	<b>447</b>	<b>\$22,944</b>	<b>\$152,366</b>

### 3.3 Natural Gas Usage

Natural gas is provided by New Jersey Natural Gas. The average gas cost for the past 12 months is \$1.046/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below. The gas use indicates seasonal variation due to winter heating. The low baseline gas use corresponds to domestic hot water heating, a year round activity.

Figure 10 -Natural Gas Usage

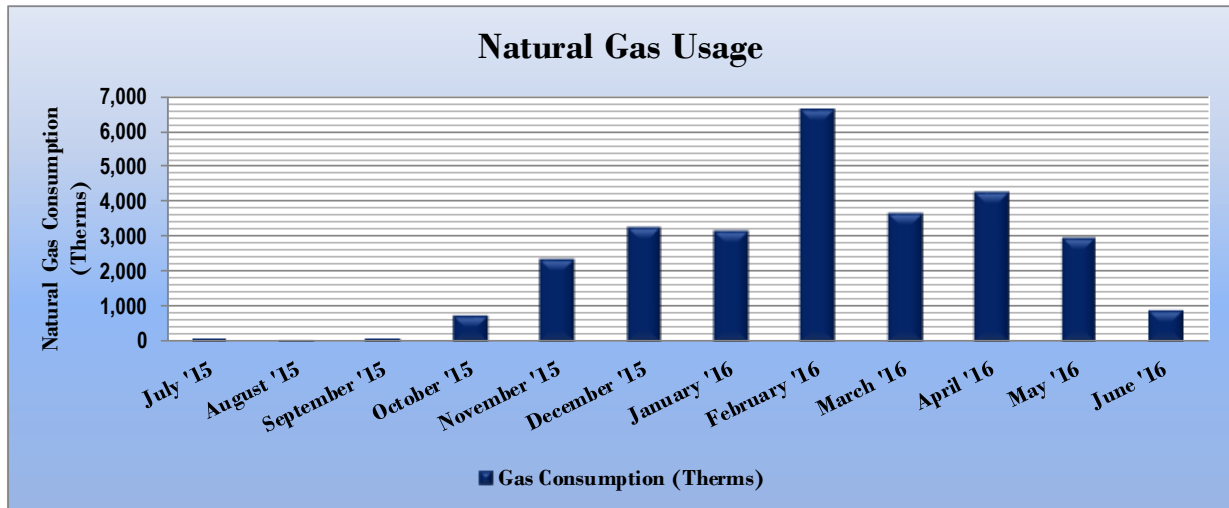


Figure 11 -Natural Gas Usage

Summary Gas Billing Data for Lacey Township Middle School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
7/15/15	30	124	\$711
8/10/15	26	87	\$559
9/9/15	30	134	\$718
10/9/15	30	754	\$1,210
11/11/15	33	2,378	\$2,483
12/14/15	33	3,311	\$3,254
1/13/16	30	3,197	\$3,164
2/16/16	34	6,656	\$5,925
3/9/16	22	3,674	\$3,422
4/12/16	34	4,273	\$4,022
5/11/16	29	2,986	\$2,995
6/14/16	34	905	\$1,333
<b>Totals</b>	<b>365</b>	<b>28,479</b>	<b>\$29,796</b>
<b>Annual</b>	<b>365</b>	<b>28,479</b>	<b>\$29,796</b>

### 3.4 Benchmarking

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

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

**Figure 12 - Energy Use Intensity Comparison – Existing Conditions**

Energy Use Intensity Comparison - Existing Conditions		
	Lacey Township Middle School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft <sup>2</sup> )	184.6	141.4
Site Energy Use Intensity (kBtu/ft <sup>2</sup> )	76.8	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 13 - Energy Use Intensity Comparison – Following Installation of Recommended Measures**

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Lacey Township Middle School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft <sup>2</sup> )	157.3	141.4
Site Energy Use Intensity (kBtu/ft <sup>2</sup> )	67.7	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 of 36.

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>.

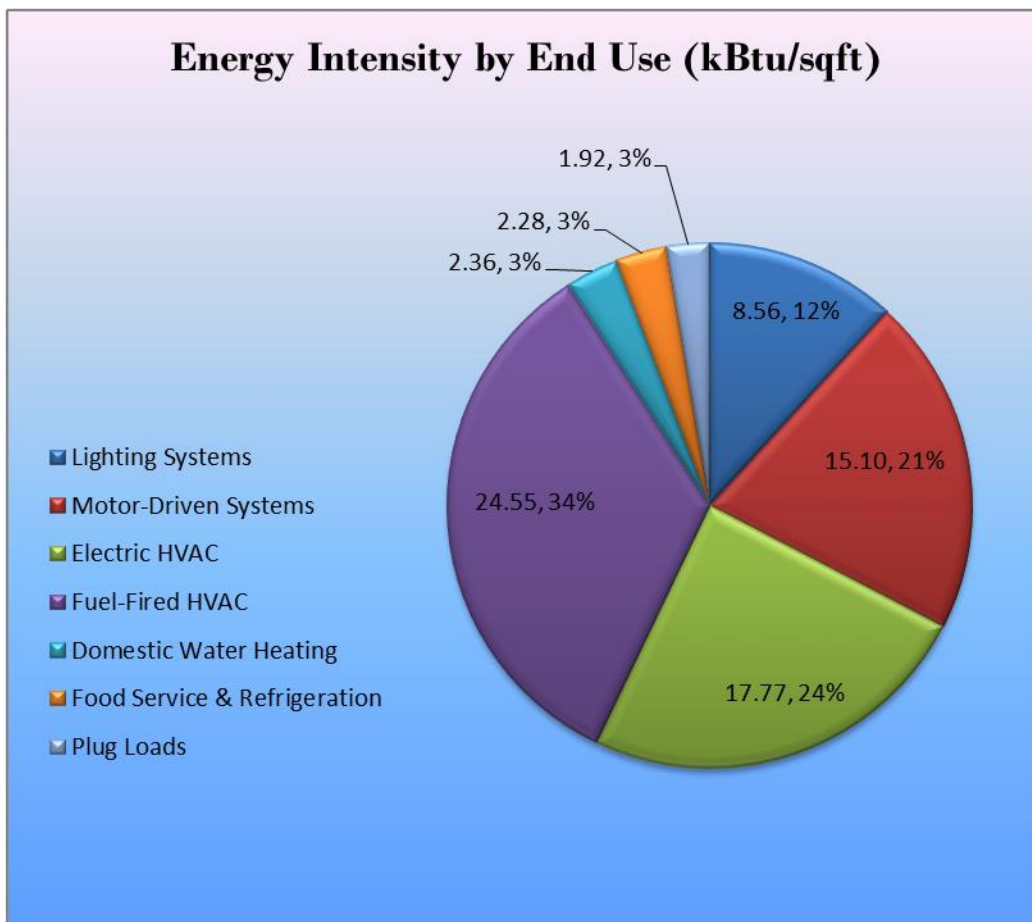
A Portfolio Manager account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio Manager regularly, so that you can keep track of your building’s performance. Free online training 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 14 - Energy Balance (kBtu/SF, %)



## 4 ENERGY CONSERVATION MEASURES

### Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Lacey Township 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 15 – Summary of Recommended ECMs*

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>156,808</b>	<b>43.5</b>	<b>0.0</b>	<b>\$15,548.43</b>	<b>\$183,373.89</b>	<b>\$18,110.00</b>	<b>\$165,263.89</b>	<b>10.6</b>	<b>157,904</b>
ECM 1	Install LED Fixtures	53,530	12.4	0.0	\$5,307.86	\$102,564.60	\$2,935.00	\$99,629.60	18.8	53,905
ECM 2	Retrofit Fixtures with LED Lamps	103,277	31.2	0.0	\$10,240.57	\$80,809.29	\$15,175.00	\$65,634.29	6.4	103,999
<b>Lighting Control Measures</b>		<b>32,432</b>	<b>9.8</b>	<b>0.0</b>	<b>\$3,215.83</b>	<b>\$22,232.00</b>	<b>\$2,680.00</b>	<b>\$19,552.00</b>	<b>6.1</b>	<b>32,659</b>
ECM 3	Install Occupancy Sensor Lighting Controls	30,017	9.1	0.0	\$2,976.35	\$19,832.00	\$2,680.00	\$17,152.00	5.8	30,227
ECM 4	Install High/Low Lighting Controls	2,415	0.7	0.0	\$239.48	\$2,400.00	\$0.00	\$2,400.00	10.0	2,432
<b>Variable Frequency Drive (VFD) Measures</b>		<b>69,491</b>	<b>9.5</b>	<b>0.0</b>	<b>\$6,890.44</b>	<b>\$17,863.05</b>	<b>\$1,200.00</b>	<b>\$16,663.05</b>	<b>2.4</b>	<b>69,977</b>
ECM 5	Install VFDs on Constant Volume (CV) HVAC	16,682	4.4	0.0	\$1,654.09	\$5,194.45	\$1,200.00	\$3,994.45	2.4	16,798
ECM 6	Install VFDs on Hot Water Pumps	52,809	5.1	0.0	\$5,236.35	\$12,668.60	\$0.00	\$12,668.60	2.4	53,178
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>62.7</b>	<b>\$655.93</b>	<b>\$365.67</b>	<b>\$0.00</b>	<b>\$365.67</b>	<b>0.6</b>	<b>7,341</b>
ECM 7	Install Low-Flow Domestic Hot Water Devices	0	0.0	62.7	\$655.93	\$365.67	\$0.00	\$365.67	0.6	7,341
<b>Plug Load Equipment Control - Vending Machine</b>		<b>3,909</b>	<b>0.0</b>	<b>0.0</b>	<b>\$387.57</b>	<b>\$920.00</b>	<b>\$0.00</b>	<b>\$920.00</b>	<b>2.4</b>	<b>3,936</b>
ECM 8	Vending Machine Control	3,909	0.0	0.0	\$387.57	\$920.00	\$0.00	\$920.00	2.4	3,936
<b>TOTALS</b>		<b>262,639</b>	<b>62.8</b>	<b>62.7</b>	<b>\$26,698.20</b>	<b>\$224,754.61</b>	<b>\$21,990.00</b>	<b>\$202,764.61</b>	<b>7.6</b>	<b>271,816</b>

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

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

## 4.1.1 Lighting Upgrades

Recommended upgrades to existing lighting fixtures are summarized in Figure 166 below.

*Figure 16 – Summary of Lighting Upgrade ECMs*

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>156,808</b>	<b>43.5</b>	<b>0.0</b>	<b>\$15,548.43</b>	<b>\$183,373.89</b>	<b>\$18,110.00</b>	<b>\$165,263.89</b>	<b>10.6</b>	<b>157,904</b>
ECM 1	Install LED Fixtures	53,530	12.4	0.0	\$5,307.86	\$102,564.60	\$2,935.00	\$99,629.60	18.8	53,905
ECM 2	Retrofit Fixtures with LED Lamps	103,277	31.2	0.0	\$10,240.57	\$80,809.29	\$15,175.00	\$65,634.29	6.4	103,999

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 <sub>2</sub> e Emissions Reduction (lbs)
Interior	31,529	9.5	0.0	\$3,126.27	\$58,589.99	\$2,930.00	\$55,659.99	17.8	31,749
Exterior	22,002	2.9	0.0	\$2,181.59	\$43,974.61	\$5.00	\$43,969.61	20.2	22,155

#### *Measure Description*

We recommend replacing existing fixtures containing metal halide 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 metal halide lamp.

### ECM 2: Retrofit Fixtures with LED Lamps

#### *Summary of Measure Economics*

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
Interior	103,277	31.2	0.0	\$10,240.57	\$80,809.29	\$15,175.00	\$65,634.29	6.4	103,999
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 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. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

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

## 4.1.2 Lighting Control Measures

*Figure 17 – Summary of Lighting Control ECMs*

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Control Measures</b>		<b>32,432</b>	<b>9.8</b>	<b>0.0</b>	<b>\$3,215.83</b>	<b>\$22,232.00</b>	<b>\$2,680.00</b>	<b>\$19,552.00</b>	<b>6.1</b>	<b>32,659</b>
ECM 3	Install Occupancy Sensor Lighting Controls	30,017	9.1	0.0	\$2,976.35	\$19,832.00	\$2,680.00	\$17,152.00	5.8	30,227
ECM 4	Install High/Low Lighting Controls	2,415	0.7	0.0	\$239.48	\$2,400.00	\$0.00	\$2,400.00	10.0	2,432

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

### ECM 3: Install Occupancy Sensor Lighting Controls

*Summary of Measure Economics*

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
30,017	9.1	0.0	\$2,976.35	\$19,832.00	\$2,680.00	\$17,152.00	5.8	30,227

*Measure Description*

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

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

## ECM 4: Install High/Low Lighting Controls

### Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
2,415	0.7	0.0	\$239.48	\$2,400.00	\$0.00	\$2,400.00	10.0	2,432

### Measure Description

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

Lighting fixtures with these controls operate at default low levels when the area is not occupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. The lighting systems are switched to full lighting levels whenever an occupant is detected. Fixtures are automatically switched back to low level after an area has been vacant for a preset period of time. Energy savings results from only providing full lighting levels when it is required.

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

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

### 4.1.3 Variable Frequency Drive Measures

Our recommendations for variable frequency drive (VFD) measures are summarized in Figure 18 below.

*Figure 18 – Summary of Variable Frequency Drive ECMs*

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Variable Frequency Drive (VFD) Measures</b>		<b>69,491</b>	<b>9.5</b>	<b>0.0</b>	<b>\$6,890.44</b>	<b>\$17,863.05</b>	<b>\$1,200.00</b>	<b>\$16,663.05</b>	<b>2.4</b>	<b>69,977</b>
ECM 5	Install VFDs on Constant Volume (CV) HVAC	16,682	4.4	0.0	\$1,654.09	\$5,194.45	\$1,200.00	\$3,994.45	2.4	16,798
ECM 6	Install VFDs on Hot Water Pumps	52,809	5.1	0.0	\$5,236.35	\$12,668.60	\$0.00	\$12,668.60	2.4	53,178

## **ECM 5: Install VFDs on Constant Volume (CV) HVAC**

### *Summary of Measure Economics*

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
16,682	4.4	0.0	\$1,654.09	\$5,194.45	\$1,200.00	\$3,994.45	2.4	16,798

### *Measure Description*

We recommend installing variable frequency drives (VFDs) to control supply fan motor speeds to convert a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one. Zone thermostats will cause the VFD to modulate fan speed to maintain the appropriate temperature in the zone, while maintaining a constant supply air temperature. Energy savings results from reducing fan speed (and power) when there is a reduced load required for the zone. The magnitude of energy savings is based on the estimated amount of time that fan motors operate at partial load.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing will have to be determined during the final project design. The control system should be programmed to maintain the minimum air flow whenever the compressor is operating.

## **ECM 6: Install VFDs on Hot Water Pumps**

### *Summary of Measure Economics*

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
52,809	5.1	0.0	\$5,236.35	\$12,668.60	\$0.00	\$12,668.60	2.4	53,178

### *Measure Description*

We recommend installing a variable frequency drives (VFD) to control hot water pumps. This measure requires that a majority of the hot water coils be served by 2-way valves and that a differential pressure sensor is installed in the hot water loop. As the hot water valves close, the differential pressure increases. The VFD modulates pump speed to maintain a differential pressure setpoint. Energy savings results from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

#### 4.1.4 Domestic Hot Water Heating System Upgrades

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

*Figure 19 - Summary of Domestic Water Heating ECMs*

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>62.7</b>	<b>\$655.93</b>	<b>\$365.67</b>	<b>\$0.00</b>	<b>\$365.67</b>	<b>0.6</b>	<b>7,341</b>
ECM 7	Install Low-Flow Domestic Hot Water Devices	0	0.0	62.7	\$655.93	\$365.67	\$0.00	\$365.67	0.6	7,341

#### ECM 7: Install Low-Flow DHW Devices

##### *Summary of Measure Economics*

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
0	0.0	62.7	\$655.93	\$365.67	\$0.00	\$365.67	0.6	7,341

##### *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. Pre-rinse spray valves (PRSVs)—often used in commercial and institutional kitchens—are designed to remove food waste from dishes prior to dishwashing. Replacing standard pre-rinse spray valves with low flow PRSVs will reduce hot water usage and save energy.

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

## 4.1.5 Plug Load Equipment Control - Vending Machines

### **ECM 8: Vending Machine Control**

#### *Summary of Measure Economics*

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
3,909	0.0	0.0	\$387.57	\$920.00	\$0.00	\$920.00	2.4	3,936

#### *Measure Description*

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



## 5 ENERGY EFFICIENT PRACTICES

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

### Reduce Air Leakage

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

### Close Doors and Windows

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

### Use Window Treatments/Coverings

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

### Perform Proper Lighting Maintenance

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

### Develop a Lighting Maintenance Schedule

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

### **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.

### **Perform Proper Boiler Maintenance**

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

## **Perform Proper Water Heater Maintenance**

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

## **Plug Load Controls**

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

## **Replace Computer Monitors**

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

## **Water Conservation**

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

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

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

## 6 ON-SITE GENERATION MEASURES

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

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

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

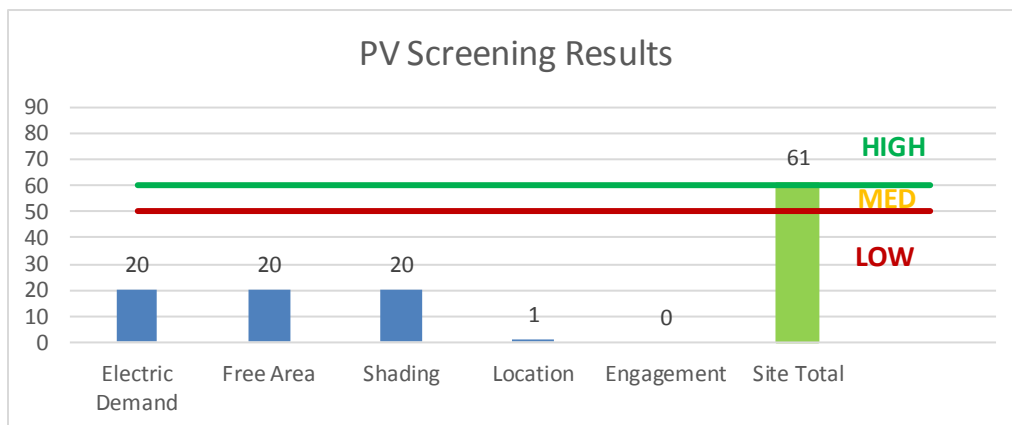
### 6.1 Photovoltaic

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

The district installed a PV array at this site in 2009, using much of the available roof area for this self-generation measure. The existing PV array currently produces about 14% of the site’s total electricity use. 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 High potential for installing additional PV arrays.

Additional solar production would offset more utility purchases. The roof area is largely utilized however, the parking lot area is a candidate for locating additional panels.

Figure 20 - Photovoltaic Screening



Solar projects must register their projects in the SREC Registration Program prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about developed new solar projects and insight into future SREC pricing. Refer to Section 8.2 for additional information.

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

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

## 6.2 Combined Heat and Power

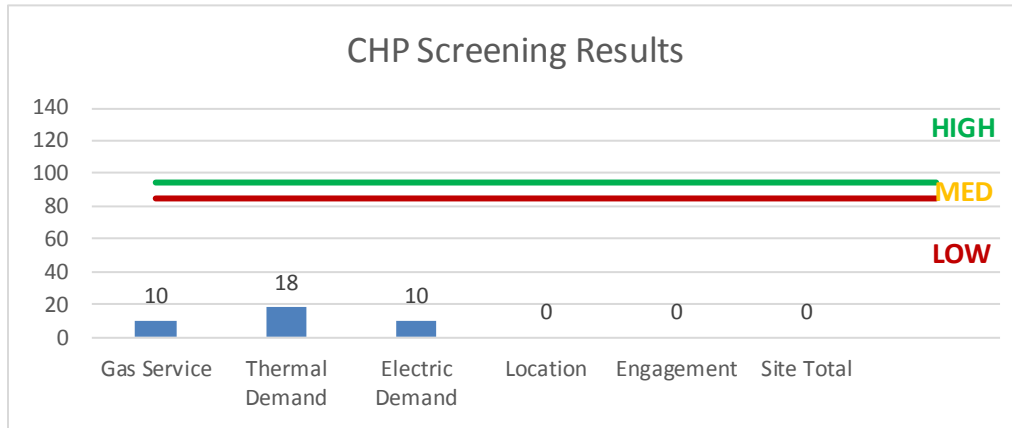
Combined heat and power (CHP) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric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

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

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

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

Figure 21 - Combined Heat and Power Screening



## 7 DEMAND RESPONSE

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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.

In our opinion this campus is not a good candidate for DR due to the minimal loads available for shedding.

## 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 222 for a list of the eligible programs identified for each recommended ECM.

*Figure 22 - ECM Incentive Program Eligibility*

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

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](http://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 (1) 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](http://www.njcleanenergy.com/SSB).

## 8.2 SREC Registration Program

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

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

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

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

Information about the SRP can be found at: [www.njcleanenergy.com/srec](http://www.njcleanenergy.com/srec).

## 8.3 Energy Savings Improvement Program

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

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

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

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

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

## 8.4 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 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 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

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### 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](http://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](http://www.state.nj.us/bpu/commercial/shopping.html).

# Appendix A: Equipment Inventory & Recommendations

## Lighting Inventory & Recommendations

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	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
Boiler Rm	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.35	1,148	0.0	\$113.79	\$936.00	\$160.00	6.82
Boiler Rm	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Mens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,320	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,320	0.02	50	0.0	\$4.97	\$58.50	\$10.00	9.76
W RR	1	Linear Fluorescent - T8:	Wall Switch	62	1,890	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.02	72	0.0	\$7.11	\$58.50	\$10.00	6.82
Ktchen	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.16	544	0.0	\$53.92	\$891.00	\$130.00	14.11
Ktchen	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	0.33	1,088	0.0	\$107.84	\$601.60	\$120.00	4.47
Ktchen	18	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	18	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.87	2,872	0.0	\$284.74	\$1,712.40	\$360.00	4.75
Ktchen	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Café	52	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	52	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	2.50	8,296	0.0	\$822.58	\$6,026.93	\$1,180.00	5.89
Café	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	0.49	1,631	0.0	\$161.77	\$902.40	\$180.00	4.47
Café	12	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	12	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.08	282	0.0	\$27.93	\$0.00	\$0.00	0.00
Café	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
fac Dining	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	0.25	816	0.0	\$80.88	\$721.20	\$125.00	7.37
fac dining	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,323	0.10	338	0.0	\$33.53	\$252.80	\$0.00	7.54
fac Dining	3	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	3	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.02	70	0.0	\$6.98	\$0.00	\$0.00	0.00
Student Store	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,890	0.07	243	0.0	\$24.14	\$190.27	\$40.00	6.23
Receiving	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,890	0.09	304	0.0	\$30.17	\$287.20	\$40.00	8.19
Girls RR	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,323	0.14	475	0.0	\$47.09	\$629.00	\$85.00	11.55
Boys RR	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,323	0.14	475	0.0	\$47.09	\$629.00	\$85.00	11.55
Boys RR	1	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	No	1	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hallway	14	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	14	Compact Fluorescent: 2L x 18 W recessed	High/Low Control	36	1,323	0.10	329	0.0	\$32.59	\$200.00	\$0.00	6.14
Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Gym	16	Metal Halide: (1) 400W Lamp	Wall Switch	458	1,890	Fixture Replacement	Yes	16	LED - Fixtures: High-Bay	Occupancy Sensor	146	1,323	3.73	12,373	0.0	\$1,226.89	\$44,043.20	\$2,540.00	33.83
Gym	24	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	176	1,890	Relamp	Yes	24	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	1,323	1.81	6,004	0.0	\$595.34	\$3,221.36	\$720.00	4.20
Gym	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	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
Girls Locker	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.60	1,994	0.0	\$197.71	\$1,827.00	\$290.00	7.77
Girls Locker	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,890	0.06	215	0.0	\$21.34	\$150.40	\$30.00	5.64
Lav	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.02	72	0.0	\$7.11	\$58.50	\$10.00	6.82
Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,323	0.09	285	0.0	\$28.25	\$331.40	\$50.00	9.96
Boys Locker	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.60	1,994	0.0	\$197.71	\$1,827.00	\$290.00	7.77
Boys Locker	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,890	0.06	215	0.0	\$21.34	\$150.40	\$30.00	5.64
Lav	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.02	72	0.0	\$7.11	\$58.50	\$10.00	6.82
Lav	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,323	0.09	285	0.0	\$28.25	\$331.40	\$50.00	9.96
Storage General	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.11	363	0.0	\$35.95	\$350.00	\$60.00	8.07
Gym Hall	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,323	0.60	1,994	0.0	\$197.71	\$1,687.00	\$220.00	7.42
Gym Hall	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
SPS Office	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	0.53	1,767	0.0	\$175.25	\$1,517.60	\$265.00	7.15
SPS Office	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,323	0.08	254	0.0	\$25.15	\$459.60	\$35.00	16.88
D103	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,890	0.10	323	0.0	\$32.00	\$225.60	\$45.00	5.64
D102	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,890	0.06	215	0.0	\$21.34	\$150.40	\$30.00	5.64
D102	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
D105	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,890	0.06	215	0.0	\$21.34	\$150.40	\$30.00	5.64
D104	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,890	0.06	215	0.0	\$21.34	\$150.40	\$30.00	5.64
D104	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,323	0.15	507	0.0	\$50.30	\$495.20	\$20.00	9.45
D104	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Super	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	0.16	544	0.0	\$53.92	\$416.80	\$80.00	6.25
D108 Conf	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	0.16	544	0.0	\$53.92	\$416.80	\$80.00	6.25

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	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
Conf	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	0.16	544	0.0	\$53.92	\$416.80	\$80.00	6.25
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.02	72	0.0	\$7.11	\$58.50	\$10.00	6.82
D110 Princip	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	0.16	544	0.0	\$53.92	\$416.80	\$80.00	6.25
Kitchenette	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,890	0.06	215	0.0	\$21.34	\$150.40	\$30.00	5.64
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.02	72	0.0	\$7.11	\$58.50	\$10.00	6.82
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.19	638	0.0	\$63.28	\$496.53	\$100.00	6.27
Main Entrance	3	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	1,890	Relamp	No	3	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,890	0.05	179	0.0	\$17.78	\$185.10	\$45.00	7.88
Main Entrance	6	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	No	6	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main Entrance	8	Metal Halide: (1) 175W Lamp	Wall Switch	215	1,890	Fixture Replacement	No	8	LED - Fixtures: Wall-Wash Lights	Wall Switch	45	1,890	0.89	2,956	0.0	\$293.10	\$2,326.91	\$240.00	7.12
Main Entrance	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hallway	14	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	1,890	Relamp	Yes	14	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	1,323	0.32	1,070	0.0	\$106.06	\$1,263.80	\$210.00	9.94
Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
A103	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	1.23	4,079	0.0	\$404.42	\$2,526.00	\$485.00	5.05
A101 Cr	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.25	816	0.0	\$80.88	\$796.50	\$125.00	8.30
A102/104	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.49	1,631	0.0	\$161.77	\$1,323.00	\$215.00	6.85
A102/104	2	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	2	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	47	0.0	\$4.66	\$0.00	\$0.00	0.00
A105/106	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.49	1,631	0.0	\$161.77	\$1,323.00	\$215.00	6.85
A105/106	2	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	2	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	47	0.0	\$4.66	\$0.00	\$0.00	0.00
Stair	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.17	574	0.0	\$56.90	\$468.00	\$80.00	6.82
Stair	5	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	No	5	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Stair	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hallway	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,323	0.25	816	0.0	\$80.88	\$651.20	\$90.00	6.94
Girls RR	16	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	Yes	16	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,323	0.23	760	0.0	\$75.34	\$844.40	\$115.00	9.68
Boys RR	16	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	Yes	16	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,323	0.23	760	0.0	\$75.34	\$844.40	\$115.00	9.68
Custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.02	72	0.0	\$7.11	\$58.50	\$10.00	6.82

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	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
C102 Science	16	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.77	2,553	0.0	\$253.10	\$1,792.13	\$355.00	5.68
C102 Science	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	Yes	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,323	0.01	47	0.0	\$4.71	\$35.90	\$5.00	6.56
C104 Prep	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.19	638	0.0	\$63.28	\$496.53	\$100.00	6.27
C101	16	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.77	2,553	0.0	\$253.10	\$1,792.13	\$355.00	5.68
C101	1	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	1	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	23	0.0	\$2.33	\$0.00	\$0.00	0.00
Media Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.09	287	0.0	\$28.45	\$234.00	\$40.00	6.82
Elec Rm	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.06	215	0.0	\$21.34	\$175.50	\$30.00	6.82
B108	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.43	1,436	0.0	\$142.37	\$1,126.20	\$215.00	6.40
B108	1	Linear Fluorescent - T8: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	1	Linear Fluorescent - T8: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	23	0.0	\$2.33	\$0.00	\$0.00	0.00
Hallway	13	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	1,890	Relamp	Yes	13	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	1,323	0.30	993	0.0	\$98.48	\$1,002.10	\$195.00	8.20
Hallway	6	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	6	Compact Fluorescent: 2L x 18 W recessed	High/Low Control	36	1,323	0.04	141	0.0	\$13.97	\$0.00	\$0.00	0.00
Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Stair	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.17	574	0.0	\$56.90	\$468.00	\$80.00	6.82
Stair	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B107	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.34	1,117	0.0	\$110.73	\$935.93	\$175.00	6.87
B107	2	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	2	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	47	0.0	\$4.66	\$0.00	\$0.00	0.00
Lav	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,320	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,320	0.02	50	0.0	\$4.97	\$58.50	\$10.00	9.76
B106B	8	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	1,890	Relamp	Yes	8	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,323	0.30	997	0.0	\$98.88	\$909.20	\$35.00	8.84
B106A	7	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	1,890	Relamp	Yes	7	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,323	0.26	873	0.0	\$86.52	\$829.30	\$35.00	9.18
B106A	1	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	1	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	23	0.0	\$2.33	\$0.00	\$0.00	0.00
B102/104/105	27	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	27	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	1.30	4,307	0.0	\$427.11	\$3,378.60	\$645.00	6.40
B102/104/105	3	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	3	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.02	70	0.0	\$6.98	\$0.00	\$0.00	0.00
B103 comp Lab	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	1.23	4,079	0.0	\$404.42	\$2,526.00	\$485.00	5.05
Stair	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.35	1,148	0.0	\$113.79	\$936.00	\$160.00	6.82
Stair	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00



Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	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
B101	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.43	1,436	0.0	\$142.37	\$1,126.20	\$215.00	6.40
Hallway	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,890	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,890	0.02	70	0.0	\$6.90	\$96.40	\$20.00	11.08
Nurse	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.14	479	0.0	\$47.46	\$401.40	\$80.00	6.77
Nurse	9	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	1,890	Relamp	Yes	9	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,323	0.34	1,122	0.0	\$111.24	\$835.10	\$20.00	7.33
Nurse	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Lav	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.02	72	0.0	\$7.11	\$58.50	\$10.00	6.82
Boiler Rm	9	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	1,890	Relamp	No	9	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,890	0.16	538	0.0	\$53.34	\$555.30	\$135.00	7.88
Boiler Rm	7	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	No	7	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Music	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.72	2,393	0.0	\$237.28	\$1,697.00	\$335.00	5.74
Music	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.03	91	0.0	\$8.99	\$58.50	\$10.00	5.40
Music	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Practice	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.43	1,436	0.0	\$142.37	\$1,126.20	\$215.00	6.40
Practice	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.11	363	0.0	\$35.95	\$234.00	\$40.00	5.40
Media Center	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.11	363	0.0	\$35.95	\$774.00	\$110.00	18.47
Media Center	10	Metal Halide: (1) 250W Lamp	Wall Switch	295	1,890	Fixture Replacement	Yes	10	LED - Fixtures: Downlight Recessed	Occupancy Sensor	86	1,323	1.54	5,103	0.0	\$506.03	\$2,711.17	\$50.00	5.26
Media Center	16	Metal Halide: (1) 250W Lamp	Wall Switch	295	1,890	Fixture Replacement	Yes	16	LED - Fixtures: Wall Sconces	Occupancy Sensor	86	1,323	2.46	8,165	0.0	\$809.65	\$6,250.83	\$160.00	7.52
Media Center	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Lib offices	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	0.25	816	0.0	\$80.88	\$567.20	\$110.00	5.65
Lib offices	6	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	1,890	Relamp	Yes	6	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,323	0.23	748	0.0	\$74.16	\$595.40	\$20.00	7.76
Hallway	7	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	1,890	Relamp	Yes	7	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	1,323	0.16	535	0.0	\$53.03	\$631.90	\$105.00	9.94
Hallway	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
E207/E208	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.43	1,436	0.0	\$142.37	\$1,396.20	\$250.00	8.05
E207/E208	1	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	1	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	23	0.0	\$2.33	\$0.00	\$0.00	0.00
GRR	16	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	Yes	16	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,323	0.23	760	0.0	\$75.34	\$1,114.40	\$150.00	12.80
BRR	16	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,890	Relamp	Yes	16	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,323	0.23	760	0.0	\$75.34	\$1,114.40	\$150.00	12.80

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	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	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.06	215	0.0	\$21.34	\$175.50	\$30.00	6.82
E203 Science	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.44	1,450	0.0	\$143.79	\$1,206.00	\$195.00	7.03
G204 Prep	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.19	638	0.0	\$63.28	\$496.53	\$100.00	6.27
G204 Prep	1	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	1	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	23	0.0	\$2.33	\$0.00	\$0.00	0.00
G201 Science	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.48	1,595	0.0	\$158.19	\$1,221.33	\$235.00	6.24
CR G202A/B	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.72	2,393	0.0	\$237.28	\$1,697.00	\$335.00	5.74
CR G202A/B	1	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	1	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	23	0.0	\$2.33	\$0.00	\$0.00	0.00
Bath	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.02	72	0.0	\$7.11	\$58.50	\$10.00	6.82
Custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,890	0.03	108	0.0	\$10.67	\$75.20	\$15.00	5.64
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.06	215	0.0	\$21.34	\$175.50	\$30.00	6.82
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.06	215	0.0	\$21.34	\$175.50	\$30.00	6.82
Hallway	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,323	0.62	2,039	0.0	\$202.21	\$1,528.00	\$225.00	6.44
Hallway	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
F204/205/206/207	36	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	36	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	1.73	5,743	0.0	\$569.48	\$4,504.80	\$860.00	6.40
F204/205/206/207	4	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	4	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.03	94	0.0	\$9.31	\$0.00	\$0.00	0.00
F203 Comp E 202	60	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	60	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,323	2.46	8,157	0.0	\$808.83	\$5,052.00	\$970.00	5.05
F203 Comp E 202	4	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	4	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.03	94	0.0	\$9.31	\$0.00	\$0.00	0.00
F202	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.43	1,436	0.0	\$142.37	\$1,126.20	\$215.00	6.40
F202	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
F201 Art	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.08	272	0.0	\$26.96	\$715.50	\$100.00	22.83
F201 Art	14	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	1,890	Relamp	Yes	14	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,323	0.53	1,745	0.0	\$173.04	\$1,118.60	\$0.00	6.46
F201 Art	2	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	2	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	47	0.0	\$4.66	\$0.00	\$0.00	0.00
F201 Art	16	Metal Halide: (1) 175W Lamp	Wall Switch	215	1,890	Fixture Replacement	Yes	16	LED - Fixtures: Downlight Recessed	Occupancy Sensor	45	1,323	1.92	6,381	0.0	\$632.75	\$4,337.87	\$80.00	6.73
F201 Art	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.08	272	0.0	\$26.96	\$291.50	\$50.00	8.96

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
VP Offices	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.43	1,436	0.0	\$142.37	\$972.20	\$200.00	5.42
H205 Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,890	0.07	243	0.0	\$24.14	\$190.27	\$40.00	6.23
H204 Off	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,890	0.07	243	0.0	\$24.14	\$190.27	\$40.00	6.23
Fac Lounge	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.29	957	0.0	\$94.91	\$686.80	\$140.00	5.76
Fac Lounge	1	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	1,890	Relamp	Yes	1	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,323	0.04	125	0.0	\$12.36	\$79.90	\$0.00	6.46
Lavs	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.04	143	0.0	\$14.22	\$117.00	\$20.00	6.82
Lavs	1	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	1,890	Relamp	No	1	LED - Linear Tubes: (3) U-Lamp	Wall Switch	50	1,890	0.03	92	0.0	\$9.16	\$79.90	\$0.00	8.72
H203	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.29	957	0.0	\$94.91	\$686.80	\$140.00	5.76
H203	3	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	3	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.02	70	0.0	\$6.98	\$0.00	\$0.00	0.00
H202	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,323	0.16	544	0.0	\$53.92	\$467.00	\$80.00	7.18
Storage	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.38	1,276	0.0	\$126.55	\$877.07	\$180.00	5.51
Storage	1	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	1	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	23	0.0	\$2.33	\$0.00	\$0.00	0.00
Storage	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
H201	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	0.29	957	0.0	\$94.91	\$686.80	\$140.00	5.76
H201	1	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	1	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.01	23	0.0	\$2.33	\$0.00	\$0.00	0.00
Hallway	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,890	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,323	0.53	1,767	0.0	\$175.25	\$1,377.60	\$195.00	6.75
E201, 203-207	54	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,890	Relamp	Yes	54	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,323	2.60	8,615	0.0	\$854.22	\$6,487.20	\$1,255.00	6.13
E201, 203-207	6	Compact Fluorescent: 2L x 18 W recessed	Wall Switch	36	1,890	None	Yes	6	Compact Fluorescent: 2L x 18 W recessed	Occupancy Sensor	36	1,323	0.04	141	0.0	\$13.97	\$0.00	\$0.00	0.00
Elevator	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	1,890	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	1,890	0.02	60	0.0	\$5.93	\$61.70	\$15.00	7.88
Elevator	6	Compact Fluorescent: single bulb	Wall Switch	18	1,890	None	No	6	Compact Fluorescent: single bulb	Wall Switch	18	1,890	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Telephone Rm	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,890	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,890	0.13	430	0.0	\$42.67	\$351.00	\$60.00	6.82
Doorway	42	Compact Fluorescent: wall mount, 2 lamp	Daylight Dimming	26	4,380	None	No	42	Compact Fluorescent: wall mount, 2 lamp	Daylight Dimming	26	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Wall mount	10	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	28	4,380	None	No	10	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	28	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Wall mount	1	Metal Halide: (1) 400W Lamp	Daylight Dimming	458	4,380	Fixture Replacement	No	1	LED - Fixtures: Outdoor Porch Wall Mount	Daylight Dimming	146	4,380	0.20	1,572	0.0	\$155.83	\$749.70	\$5.00	4.78
Parking pole	3	Metal Halide: (1) 400W Lamp	Daylight Dimming	458	4,380	Fixture Replacement	No	3	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	146	4,380	0.61	4,715	0.0	\$467.48	\$9,974.98	\$0.00	21.34

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
Parking Pole	10	Metal Halide: (1) 400W Lamp	Daylight Dimming	458	4,380	Fixture Replacement	No	10	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	146	4,380	2.05	15,715	0.0	\$1,558.28	\$33,249.93	\$0.00	21.34
Pathway	11	LED - Fixtures: Bollard Fixture	Daylight Dimming	146	4,380	None	No	11	LED - Fixtures: Bollard Fixture	Daylight Dimming	146	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Muisc RTU 4	1	Supply Fan	5.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Muisc RTU 4	1	Return Fan	1.5	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Café RTU 1	1	Supply Fan	15.0	91.0%	No	3,570	No	91.0%	Yes	1	4.41	16,682	0.0	\$1,654.09	\$5,194.45	\$1,200.00	2.41
Roof	Café RTU 1	1	Return Fan	2.0	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Café RTU 2	1	Supply Fan	5.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Café RTU 2	1	Return Fan	1.5	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Teachers Lounge RTU 3	1	Supply Fan	5.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Teachers Lounge RTU 3	1	Return Fan	1.5	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Pincipals Office RTU 10	1	Supply Fan	3.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Pincipals Office RTU 10	1	Return Fan	1.0	82.5%	No	3,570	No	82.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Main Office RTU 9	1	Supply Fan	5.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Main Office RTU 9	1	Return Fan	1.5	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Computer Lab RTU 8	1	Supply Fan	5.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Computer Lab RTU 8	1	Return Fan	1.5	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Media Center RTU 7	1	Supply Fan	5.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Media Center RTU 7	1	Return Fan	1.5	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Media Center RTU 6	1	Supply Fan	5.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Media Center RTU 6	1	Return Fan	1.5	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Lib Hall/Office RTU 5	1	Supply Fan	3.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Lib Hall/Office RTU 5	1	Return Fan	1.5	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Store Room, Split System	1	Supply Fan	0.3	70.0%	No	3,570	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Gym Office 1	1	Supply Fan	0.1	70.0%	No	3,570	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Gym Office 2	1	Supply Fan	0.1	70.0%	No	3,570	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	HV 1 Kitchen	1	Supply Fan	3.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	HV 1 Kitchen	1	Return Fan	1.0	82.5%	No	3,570	No	82.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	HV 2 Gym	1	Supply Fan	3.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	HV 2 Gym	1	Return Fan	1.0	82.5%	No	3,570	No	82.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	HV 2a Gym	1	Supply Fan	3.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	HV2a Gym	1	Return Fan	1.0	82.5%	No	3,570	No	82.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	HV 3 Lockers	1	Supply Fan	3.0	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	HV 3 Lockers	1	Return Fan	1.0	82.5%	No	3,570	No	82.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Boiler	HHW 1	1	Heating Hot Water Pump	20.0	93.6%	No	3,570	No	93.6%	Yes	1	2.56	26,405	0.0	\$2,618.17	\$6,334.30	\$0.00	2.42
Boiler	HHW 2	1	Heating Hot Water Pump	20.0	93.6%	No	3,570	No	93.6%	Yes	1	2.56	26,405	0.0	\$2,618.17	\$6,334.30	\$0.00	2.42
Boiler	DHW circ pump	1	Water Supply Pump	0.3	74.0%	No	8,760	No	74.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Restrooms	6	Exhaust Fan	0.3	87.5%	No	3,570	No	87.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Classes	30	Supply Fan	2.0	84.0%	No	3,570	No	84.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Elevator Rm	Elevator	1	Process Pump	20.0	93.6%	No	180	No	93.6%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Electric HVAC Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions		Proposed Conditions									Energy Impact & Financial Analysis							
		System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Muisc RTU 4	1	Packaged AC	12.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Café RTU 1	1	Packaged AC	40.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Café RTU 2	1	Packaged AC	18.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Teachers Lounge RTU 3	1	Packaged AC	12.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Pincipals Office RTU 10	1	Packaged AC	10.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Main Office RTU 9	1	Packaged AC	18.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Computer Lab RTU 8	1	Packaged AC	18.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Media Center RTU 7	1	Packaged AC	18.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Media Center RTU 6	1	Packaged AC	20.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Lib Hall/Office RTU 5	1	Packaged AC	5.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Store Room, Split System	1	Split-System AC	4.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Gym Office 1	1	Split-System AC	1.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Gym Office 2	1	Split-System AC	1.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Various	Classes	30	Split-System AC	5.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Fuel Heating Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions		Proposed Conditions							Energy Impact & Financial Analysis								
		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 Rm	School	2	Non-Condensing Hot Water Boiler	5,400.00	No								0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### DHW Inventory & Recommendations

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

### Low-Flow Device Recommendations

Location	Recommendation Inputs				Energy Impact & Financial Analysis						
	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
various	8	Faucet Aerator (Kitchen)	2.50	2.20	0.00	0	2.2	\$23.53	\$57.36	\$0.00	2.44
various	43	Faucet Aerator (Lavatory)	2.50	1.00	0.00	0	60.4	\$632.40	\$308.31	\$0.00	0.49

### Reach-In Cooler/Freezer Inventory & Recommendations

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



### Walk-In Cooler/Freezer Inventory & Recommendations

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

### Commercial Refrigerator/Freezer Inventory & Recommendations

Location	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	2	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Stand-Up Refrigerator, Glass Door (>50 cu. ft.)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Cooking Equipment Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
	Quantity	Equipment Type	High Efficiency Equipment?	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	4	Electric Convection Oven (Full Size)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	2	Insulated Food Holding Cabinet (Full Size)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	2	Insulated Food Holding Cabinet (Full Size)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Electric Steamer	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Dishwasher Inventory & Recommendations

Location	Existing Conditions					Proposed Conditions	Energy Impact & Financial Analysis						
	Quantity	Dishwasher Type	Water Heater Fuel Type	Booster Heater Fuel Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Payback w/ Incentives in Years
Kitchen	1	Door Type (High Temp)	Electric	Electric	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?
School	196	Computer	75.0	Yes
School	11	Laptop	40.0	Yes
School	7	Small Copier	20.0	No
School	17	Medium Copier	268.0	Yes
School	3	Big copier	515.0	Yes
School	2	Paper Shredder	360.0	No
School	40	Projector	200.0	Yes
School	11	Microwave	1,000.0	Yes
School	6	Large Refrigerator	600.0	Yes
School	1	Medium Refrigerator	50.0	Yes
School	2	Small Refrigerator	27.6	Yes
School	6	Coffee Machine	400.0	No
School	3	Toaster	1,200.0	No
School	3	Toaster Oven	1,200.0	No
School	1	Clothes Washer	900.0	No
School	1	Clothes Dryer	1,600.0	No
School	1	Dishwasher	1,000.0	No
School	36	Smart Board	7.0	No
School	3	CRT TV (24")	123.0	Yes
School	1	CRT TV (42")	200.0	Yes


### Vending Machine Inventory & Recommendations

Location	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
	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
Café	1	Refrigerated	Yes	0.00	1,612	0.0	\$159.82	\$230.00	\$0.00	1.44
Café	1	Non-Refrigerated	Yes	0.00	343	0.0	\$33.96	\$230.00	\$0.00	6.77
Fac Dining	1	Refrigerated	Yes	0.00	1,612	0.0	\$159.82	\$230.00	\$0.00	1.44
Fac Dining	1	Non-Refrigerated	Yes	0.00	343	0.0	\$33.96	\$230.00	\$0.00	6.77

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



### ENERGY STAR® Statement of Energy Performance



**ENERGY STAR®  
Score<sup>1</sup>**

### Lacey Township Middle School

Primary Property Type: K-12 School  
Gross Floor Area (ft<sup>2</sup>): 106,000  
Built: 2000

For Year Ending: May 31, 2016  
Date Generated: June 09, 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		
<b>Property Address</b> Lacey Township Middle School 66 Denton Avenue Forked River, New Jersey 08731	<b>Property Owner</b> _____ ( ) - _____	<b>Primary Contact</b> _____ ( ) - _____
<b>Property ID:</b> 2388310		

Energy Consumption and Energy Use Intensity (EUI)				
<b>Site EUI</b> 77.8 kBtu/ft <sup>2</sup>	<b>Annual Energy by Fuel</b>		<b>National Median Comparison</b>	
	Electric - Solar (kBtu)	753,721 (9%)	National Median Site EUI (kBtu/ft <sup>2</sup> )	68.8
	Natural Gas (kBtu)	2,862,549 (35%)	National Median Source EUI (kBtu/ft <sup>2</sup> )	152.7
	Electric - Grid (kBtu)	4,827,282 (56%)	% Diff from National Median Source EUI	13%
<b>Source EUI</b> 172.5 kBtu/ft <sup>2</sup>			<b>Annual Emissions</b>	
			Greenhouse Gas Emissions (Metric Tons CO <sub>2</sub> e/year)	683

### 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)