



# Local Government Energy Audit: Energy Audit Report



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## ***Hillside High School***

1085 Liberty Ave

Hillside, NJ 07205

Hillside Board of Education

September 25, 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.

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# I EXECUTIVE SUMMARY

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The New Jersey Board of Public Utilities (NJBPUB) has sponsored this Local Government Energy Audit (LGEA) Report for the Hillside High School.

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

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

## I.1 Facility Summary

The Hillside High School is a 157,000 square foot, three-story high school (Grades 9-12). The school consists of classrooms, administrative offices, gym, and cafeteria/kitchen. The various spaces are connected by covered corridors/hallways and stairwells.

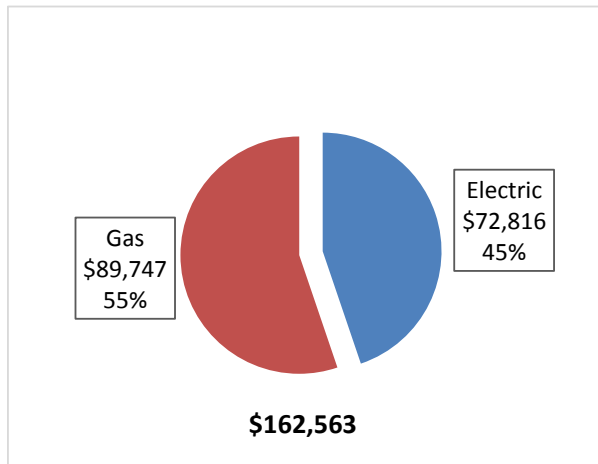
Lighting at the Hillside High School consists primarily of T8 fluorescent sources, which are inefficient as compared to currently available alternatives. Heating in the classrooms is provided by unit ventilators, and cooling is provided by window A/C units. A thorough description of the facility and our observations are in Section 2.

## I.2 Your Cost Reduction Opportunities

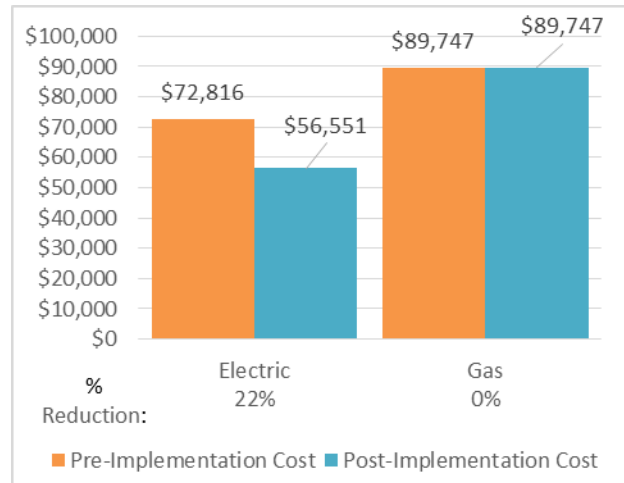
### Energy Conservation Measures

TRC evaluated eight measures and recommends seven measures which together represent an opportunity for the Hillside High School to reduce annual energy costs by \$16,264 and annual greenhouse gas emissions by 138,043 lbs CO<sub>2</sub>e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 8.2 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce the Hillside High School's annual energy use by 11%.

**Figure 1 – Previous 12 Month Utility Costs**



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



A detailed description of the Hillside High School's existing energy use can be found in Section 3.

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

**Figure 3 – Summary of Energy Reduction Opportunities**

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Natural Gas Savings (MMBtu)	Annual 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>111,377</b>	<b>39.2</b>	<b>0.0</b>	<b>\$13,122.49</b>	<b>\$118,145.22</b>	<b>\$18,505.00</b>	<b>\$99,640.22</b>	<b>7.6</b>	<b>112,156</b>
ECM 1	Install LED Fixtures	Yes	4,257	0.6	0.0	\$501.60	\$2,709.31	\$410.00	\$2,299.31	4.6	4,287
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	189	0.1	0.0	\$22.24	\$234.00	\$20.00	\$214.00	9.6	190
ECM 3	Retrofit Fixtures with LED Lamps	Yes	104,391	38.4	0.0	\$12,299.34	\$114,126.36	\$18,075.00	\$96,051.36	7.8	105,121
ECM 4	Install LED Exit Signs	Yes	2,540	0.2	0.0	\$299.31	\$1,075.55	\$0.00	\$1,075.55	3.6	2,558
<b>Lighting Control Measures</b>			<b>21,145</b>	<b>7.5</b>	<b>0.0</b>	<b>\$2,491.35</b>	<b>\$35,910.00</b>	<b>\$3,920.00</b>	<b>\$31,990.00</b>	<b>12.8</b>	<b>21,293</b>
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	18,178	6.4	0.0	\$2,141.75	\$30,780.00	\$3,920.00	\$26,860.00	12.5	18,305
ECM 6	Install High/Low Lighting Controls	Yes	2,967	1.0	0.0	\$349.60	\$5,130.00	\$0.00	\$5,130.00	14.7	2,988
<b>Gas Heating (HVAC/Process) Replacement</b>			<b>0</b>	<b>0.0</b>	<b>254.0</b>	<b>\$2,347.40</b>	<b>\$111,517.93</b>	<b>\$6,000.00</b>	<b>\$105,517.93</b>	<b>45.0</b>	<b>29,736</b>
	Install High Efficiency Steam Boilers	No	0	0.0	254.0	\$2,347.40	\$111,517.93	\$6,000.00	\$105,517.93	45.0	29,736
<b>Plug Load Equipment Control - Vending Machine</b>			<b>5,521</b>	<b>0.0</b>	<b>0.0</b>	<b>\$650.43</b>	<b>\$1,150.00</b>	<b>\$0.00</b>	<b>\$1,150.00</b>	<b>1.8</b>	<b>5,559</b>
ECM 7	Vending Machine Control	Yes	5,521	0.0	0.0	\$650.43	\$1,150.00	\$0.00	\$1,150.00	1.8	5,559
<b>EVALUATED PROJECT TOTALS</b>			<b>138,043</b>	<b>46.6</b>	<b>254.0</b>	<b>\$18,611.68</b>	<b>\$266,723.14</b>	<b>\$28,425.00</b>	<b>\$238,298.14</b>	<b>12.8</b>	<b>168,745</b>
<b>RECOMMENDED PROJECT TOTALS</b>			<b>138,043</b>	<b>46.6</b>	<b>0.0</b>	<b>\$16,264.28</b>	<b>\$155,205.22</b>	<b>\$22,425.00</b>	<b>\$132,780.22</b>	<b>8.2</b>	<b>139,008</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.

**Gas Heating (HVAC/Process)** measures generally involve replacing older inefficient hydronic heating systems with modern energy efficient systems. Gas heating systems can provide equivalent heating compared to older systems at a reduced energy cost. These measures save energy by reducing the fuel demands for heating, due to improved combustion and heat transfer efficiency.

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

## Energy Efficient Practices

TRC also identified 13 low cost (or no cost) energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at the Hillside High School include:

- Reduce Air Leakage
- Close Doors and Windows
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Turn Off Unneeded Motors
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Repair/Replace Steam Traps



- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Install Plug Load Controls
- Water Conservation

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

## **On-Site Generation Measures**

TRC evaluated the potential for installing on-site generation for the Hillside High School. Based on the configuration of the site and its loads there is a high potential for installing a photovoltaic (PV) array.

**Figure 4 – Photovoltaic Potential**

Potential	High	
System Potential	100	kW DC STC
Electric Generation	119,137	kWh/yr
Displaced Cost	\$10,360	/yr
Installed Cost	\$416,000	

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

## **1.3 Implementation Planning**

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

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

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

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

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

This facility may also qualify for the Direct Install program which can provide turnkey installation of multiple measures, through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures, although

measure eligibility will have to be assessed and be verified by the designated Direct Install contractor and, in most cases, they will perform the installation work.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 0 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 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 5 – Project Contacts*

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

### 2.2 General Site Information

On February 20, 2018, TRC performed an energy audit at the Hillside High School located in Hillside, New Jersey. TRC's team met with David DeFluri, District Facility Manager to review the facility operations and help focus our investigation on specific energy-using systems.

The Hillside High School is a 157,000 square-foot, three-story high school (Grades 9-12). Constructed in 1939 and renovated in 1958, the school is mainly comprised of classrooms, administrative offices, gym, and cafeteria/kitchen. The various spaces are connected by covered corridors/hallways and stairwells.

Lighting at the Hillside High School consists primarily of T8 fluorescent sources, which are inefficient as compared to currently available alternatives. Central steam boilers serve unit ventilators in the classrooms and cooling is provided by window A/C units, split-system air-source heat pump units and package ACs.

There is also 150 kW solar system on several roof sections of the school.

During the audit, on a cold day, it was noted that several rooms had opened windows to control the temperature in their room (over heated). There could be gas savings opportunities by adding or tuning thermal controls for the various radiators, unit ventilators and fan coil units throughout the building.

### 2.3 Building Occupancy

The school building is open Monday through Friday from 5:00 AM through 10:30 PM during the school year, September through June. The building is open July and August for summer school. The building is frequently occupied on weekends for various community activities and events. During a typical day, the facility is occupied by 150 staff and 850 students.

*Figure 6 - Building Schedule*

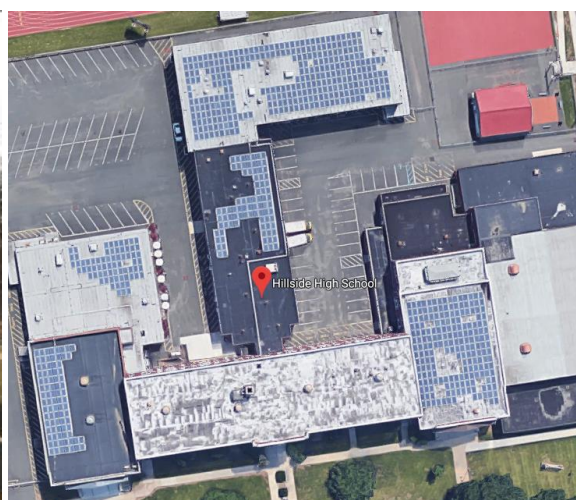
Building Name	Weekday/Weekend	Operating Schedule
Hillside High School	Weekday	5:00 am - 10:30 pm
Hillside High School	Weekend	open for Events

## 2.4 Building Envelope

The Hillside High School main building was constructed in 1939 and renovated in 1959. The main building is constructed of concrete block and structural steel with a brick façade. There are other buildings that have been added since initial construction that are made of insulated wall panels. The buildings have flat roof sections. There are also operable double paned windows constructed of aluminum which are in good condition. The exterior doors are constructed of aluminum and tempered glass in good condition.



*Image 1 – Building Envelope/Windows*



*Image 2 – Roof*

## 2.5 On-Site Generation

The Hillside High School has a 150 kW solar PV system on the roof of the school. The system provides 22% of the electric energy (kWh) for the facility. The energy is purchased through a PPA.

## 2.6 Energy-Using Systems

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

### Lighting System

Interior lighting at the facility is provided mostly by linear fluorescent T8 lamps with electronic ballasts, incandescent lamps, and compact fluorescent (CFL) with 2-pin lamps. The linear fluorescent fixtures are located in all areas of the building. The exterior lighting is provided by LED wall packs and are controlled by photocell light sensors.



**Image 3 – T8 Fluorescent Lighting  
(locker room)**



**Image 4 – T8 Fluorescent Lighting  
(class room)**

Lighting control in all interior spaces is provided mainly by manual switches. There are occupancy sensor controls in only a few areas of the building. The LED and incandescent exit signs operate 24 hours per day for security reasons.

The exterior lighting is mainly comprised of LED wall packs and flood lights.

### **Steam Heating System**

The steam heating system (SHS) consists of two Cleaver Brooks steam boilers, each with an estimated output capacity of 3,000 kBtu/hr. The boilers are forced draft and have a nominal combustion efficiency of about 80%. The boilers provide steam to the radiators, unit ventilators and fan coil units throughout the building via a two-pipe distribution system. The boilers are 60 years old which is well past the useful life.

There are issues with condensate leaks and overheating in several rooms that need to be addressed. At the audit windows in certain rooms were opened to release excess heat. It is recommended that a full evaluation of the steam loops to address leaks and tune or add thermal control to certain radiators or coils.



**Image 5 – Steam Boilers**



**Image 6 – Unit Ventilator**

The steam boilers are very old and well past the end of their useful life.



## **Direct Expansion Air Conditioning System (DX)**

There are 52 window air conditioners (ACs) located throughout the school building (classrooms, cafeteria, offices, etc.). The systems are generally 3/4-ton capacity and about 15 years old.

There are three split-system air-source heat pump (HP) systems. The systems serve the server room. There is also one 7.5-ton Package Unit (York) located on the roof above Rooms 225 and 227 (science rooms with fume hoods).



*Image 7 – Window AC*



*Image 8 – Split HP Outdoor Coil Unit  
(Server Room)*

## **Domestic Hot Water Heating System**

The domestic hot water (DHW) heating systems for the school consist of three natural gas-fired storage tank water heaters. There is also one 119-gallon natural gas-fired storage tank water heater located in boiler room with an input rating of 325 kBtu/hr. and a nominal efficiency of about 80%. This water heater serves the buildings restrooms. There are two other DHW heaters that serve the kitchen. These water heaters are 71 gallons and 85 gallons with input rating of 120 kBtu/hr. and 500 kBtu/hr., respectively. The nominal efficiencies are about 80%.

## **Food Service & Laundry Equipment**

The school has a kitchen that is used to prepare 1,000 lunches per day for the students and staff. Most of the cooking is done using the gas ovens, steamers and a large stove.

## **Refrigeration**

The kitchen has several refrigerators and coolers as well as two walk-in freezers and a walk-in cooler. These appliances appear to be new.

## **Building Plug Load**

There are 187 laptops and desktop computers throughout the facility. Most of the classrooms have smart-boards (54) and projectors (60). There is also various office equipment (copiers, printers, etc.) and small refrigerators located throughout the school.

## 3 SITE ENERGY USE AND COSTS

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

### 3.1 Total Cost of Energy

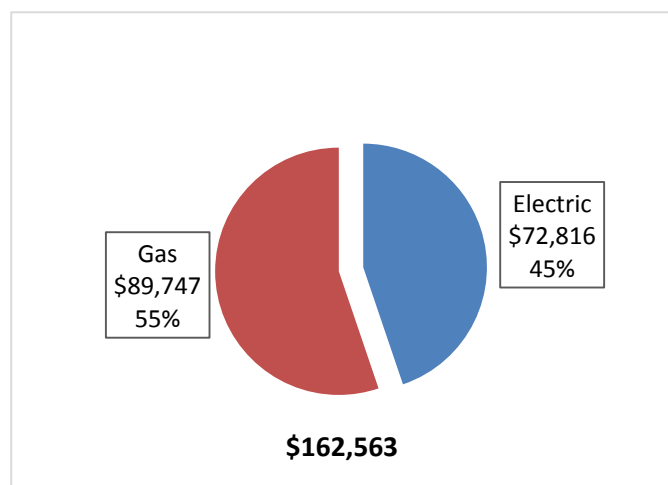
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

*Figure 7 - Utility Summary*

Utility Summary for Hillside High School		
Fuel	Usage	Cost
Electricity	618,024 kWh	\$72,816
Natural Gas	97,098 Therms	\$89,747
Total		\$162,563

The current annual energy cost for this facility is \$162,563 as shown in the chart below.

*Figure 8 - Energy Cost Breakdown*



## 3.2 Electricity Usage

Electricity is provided by PSE&G (grid) and solar. There is a 150 kW solar system on the roof of the school. The solar energy is sold by Tioga Solar (PPA). The average electric cost (solar and grid) over the past 12 months was \$0.118/kWh, which is the blended rate that includes energy supply, distribution, and other charges (for solar and grid). This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 9 - Electric Usage & Demand

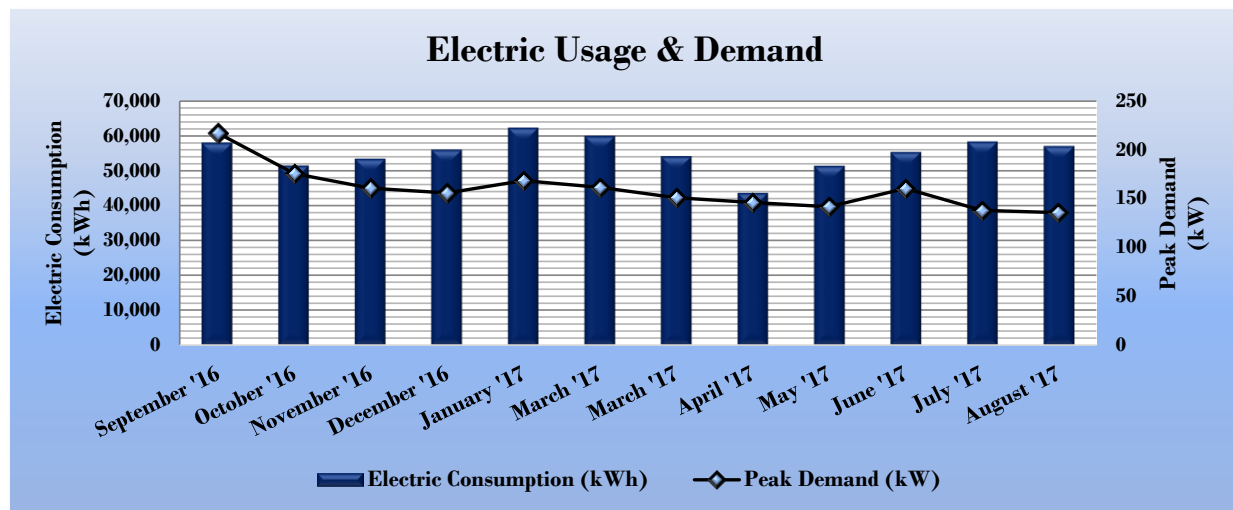


Figure 10 - Electric Usage & Demand

Electric Billing Data for Hillside High School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
9/28/16	30	57,774	217		\$8,201
10/27/16	29	51,294	176		\$5,524
11/29/16	33	53,197	161		\$5,611
12/29/16	30	55,815	156		\$5,734
1/30/17	32	62,069	169		\$6,447
3/30/17	59	59,758	162		\$6,329
3/30/17	29	53,958	151		\$5,967
5/1/17	32	43,498	146		\$5,296
5/25/17	24	51,204	142		\$6,154
6/26/17	32	55,153	160		\$7,737
7/26/17	30	58,097	138		\$7,513
8/24/17	29	56,844	136		\$7,090
<b>Totals</b>	<b>389</b>	<b>658,661</b>	<b>217.2</b>	<b>\$0</b>	<b>\$77,604</b>
<b>Annual</b>	<b>365</b>	<b>618,024</b>	<b>217.2</b>	<b>\$0</b>	<b>\$72,816</b>



### 3.3 Natural Gas Usage

Natural gas is provided by Elizabethtown Gas. The average gas cost for the past 12 months is \$0.924/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below. The usage profile is normal for a gas heated building with little summertime DHW use.

Figure 11 - Natural Gas Usage

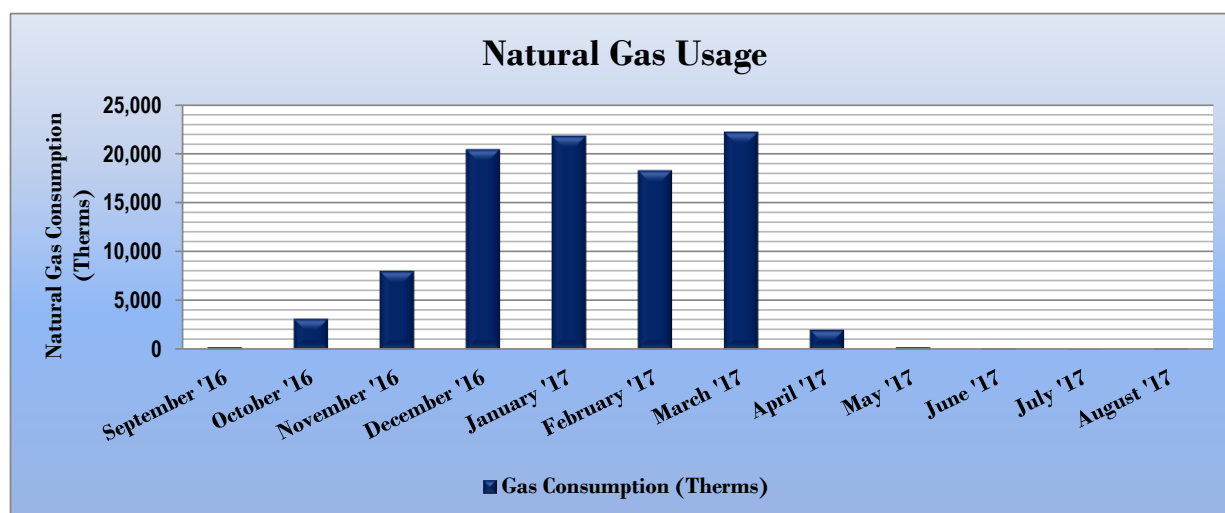


Figure 12 - Natural Gas Usage

Gas Billing Data for Hillside High School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
10/4/16	32	227	\$1,356
11/2/16	29	3,111	\$3,487
12/3/16	31	8,001	\$6,972
1/4/17	32	20,433	\$17,175
2/1/17	28	21,818	\$19,677
3/2/17	29	18,289	\$15,546
4/3/17	32	22,232	\$16,920
5/2/17	29	1,989	\$2,959
6/2/17	31	228	\$1,358
7/3/17	31	115	\$1,334
8/3/17	31	10	\$1,198
8/31/17	28	113	\$1,273
<b>Totals</b>	<b>363</b>	<b>96,566</b>	<b>\$89,256</b>
<b>Annual</b>	<b>365</b>	<b>97,098</b>	<b>\$89,747</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 13 - Energy Use Intensity Comparison – Existing Conditions**

Energy Use Intensity Comparison - Existing Conditions		
	Hillside High School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft <sup>2</sup> )	107.1	141.4
Site Energy Use Intensity (kBtu/ft <sup>2</sup> )	75.3	58.2

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

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

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Hillside High School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft <sup>2</sup> )	91.4	141.4
Site Energy Use Intensity (kBtu/ft <sup>2</sup> )	66.3	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 % of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 83.

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

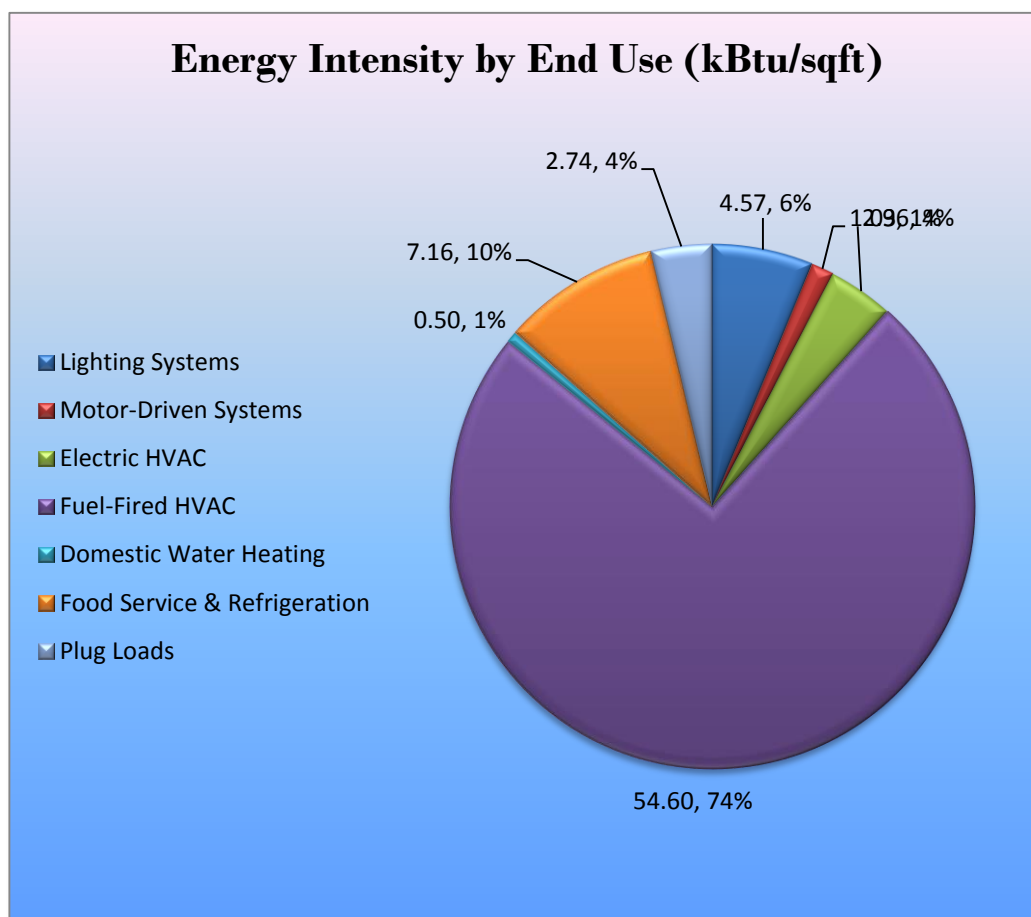
For more information on ENERGY STAR® certification go to: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1>.

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

### 3.5 Energy End-Use Breakdown

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

*Figure 15 - Energy Balance (% and kBtu/SF)*



## 4 ENERGY CONSERVATION MEASURES

### Level of Analysis

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

The following sections describe the evaluated measures.

### 4.1 Recommended ECMs

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

*Figure 16 – Summary of Recommended ECMs*

Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Natural Gas 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>111,377</b>	<b>39.2</b>	<b>0.0</b>	<b>\$13,122.49</b>	<b>\$118,145.22</b>	<b>\$18,505.00</b>	<b>\$99,640.22</b>	<b>7.6</b>	<b>112,156</b>
ECM 1   Install LED Fixtures	Yes	4,257	0.6	0.0	\$501.60	\$2,709.31	\$410.00	\$2,299.31	4.6	4,287
ECM 2   Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	189	0.1	0.0	\$22.24	\$234.00	\$20.00	\$214.00	9.6	190
ECM 3   Retrofit Fixtures with LED Lamps	Yes	104,391	38.4	0.0	\$12,299.34	\$114,126.36	\$18,075.00	\$96,051.36	7.8	105,121
ECM 4   Install LED Exit Signs	Yes	2,540	0.2	0.0	\$299.31	\$1,075.55	\$0.00	\$1,075.55	3.6	2,558
<b>Lighting Control Measures</b>		<b>21,145</b>	<b>7.5</b>	<b>0.0</b>	<b>\$2,491.35</b>	<b>\$35,910.00</b>	<b>\$3,920.00</b>	<b>\$31,990.00</b>	<b>12.8</b>	<b>21,293</b>
ECM 5   Install Occupancy Sensor Lighting Controls	Yes	18,178	6.4	0.0	\$2,141.75	\$30,780.00	\$3,920.00	\$26,860.00	12.5	18,305
ECM 6   Install High/Low Lighting Controls	Yes	2,967	1.0	0.0	\$349.60	\$5,130.00	\$0.00	\$5,130.00	14.7	2,988
<b>Gas Heating (HVAC/Process) Replacement</b>		<b>0</b>	<b>0.0</b>	<b>254.0</b>	<b>\$2,347.40</b>	<b>\$111,517.93</b>	<b>\$6,000.00</b>	<b>\$105,517.93</b>	<b>45.0</b>	<b>29,736</b>
Install High Efficiency Steam Boilers	No	0	0.0	254.0	\$2,347.40	\$111,517.93	\$6,000.00	\$105,517.93	45.0	29,736
<b>Plug Load Equipment Control - Vending Machine</b>		<b>5,521</b>	<b>0.0</b>	<b>0.0</b>	<b>\$650.43</b>	<b>\$1,150.00</b>	<b>\$0.00</b>	<b>\$1,150.00</b>	<b>1.8</b>	<b>5,559</b>
ECM 7   Vending Machine Control	Yes	5,521	0.0	0.0	\$650.43	\$1,150.00	\$0.00	\$1,150.00	1.8	5,559
<b>EVALUATED PROJECT TOTALS</b>		<b>138,043</b>	<b>46.6</b>	<b>254.0</b>	<b>\$18,611.68</b>	<b>\$266,723.14</b>	<b>\$28,425.00</b>	<b>\$238,298.14</b>	<b>12.8</b>	<b>168,745</b>
<b>RECOMMENDED PROJECT TOTALS</b>		<b>138,043</b>	<b>46.6</b>	<b>0.0</b>	<b>\$16,264.28</b>	<b>\$155,205.22</b>	<b>\$22,425.00</b>	<b>\$132,780.22</b>	<b>8.2</b>	<b>139,008</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

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

**Figure 17 – Summary of Lighting Upgrade ECMs**

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>111,377</b>	<b>39.2</b>	<b>0.0</b>	<b>\$13,122.49</b>	<b>\$118,145.22</b>	<b>\$18,505.00</b>	<b>\$99,640.22</b>	<b>7.6</b>	<b>112,156</b>
ECM 1	Install LED Fixtures	4,257	0.6	0.0	\$501.60	\$2,709.31	\$410.00	\$2,299.31	4.6	4,287
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	189	0.1	0.0	\$22.24	\$234.00	\$20.00	\$214.00	9.6	190
ECM 3	Retrofit Fixtures with LED Lamps	104,391	38.4	0.0	\$12,299.34	\$114,126.36	\$18,075.00	\$96,051.36	7.8	105,121
ECM 4	Install LED Exit Signs	2,540	0.2	0.0	\$299.31	\$1,075.55	\$0.00	\$1,075.55	3.6	2,558

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	0	0.0	0.0	\$0.00	\$0.00	\$0.00	\$0.00	0.0	0
Exterior	4,257	0.6	0.0	\$501.60	\$2,709.31	\$410.00	\$2,299.31	4.6	4,287

#### *Measure Description*

We recommend replacing existing exterior 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 longer lifetimes than most other lighting technologies.

## ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

### Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
Interior	189	0.1	0.0	\$22.24	\$234.00	\$20.00	\$214.00	9.6	190
Exterior	0	0.0	0.0	\$0.00	\$0.00	\$0.00	\$0.00	0.0	0

### Measure Description

We recommend retrofitting existing T12 fluorescent fixtures located in Classroom 137 (Art Room/Black Room) by removing fluorescent tubes and ballasts and replacing them with LEDs and LED drivers (if necessary), which are designed to be used retrofitted fluorescent fixtures. The measure uses the existing fixture housing but replaces the rest of the components with more efficient lighting technology. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

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

## ECM 3: Retrofit Fixtures with LED Lamps

### Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
Interior	101,790	37.7	0.0	\$11,992.91	\$112,573.80	\$17,910.00	\$94,663.80	7.9	102,502
Exterior	2,601	0.7	0.0	\$306.43	\$1,552.55	\$165.00	\$1,387.55	4.5	2,619

### Measure Description

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

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

## ECM 4: Install LED Exit Signs

### Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
Interior	2,540	0.2	0.0	\$299.31	\$1,075.55	\$0.00	\$1,075.55	3.6	2,558
Exterior	0	0.0	0.0	\$0.00	\$0.00	\$0.00	\$0.00	0.0	0

### Measure Description

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

## 4.1.2 Lighting Control Measures

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

**Figure 18 – Summary of Lighting Control ECMs**

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Control Measures</b>		<b>21,145</b>	<b>7.5</b>	<b>0.0</b>	<b>\$2,491.35</b>	<b>\$35,910.00</b>	<b>\$3,920.00</b>	<b>\$31,990.00</b>	<b>12.8</b>	<b>21,293</b>
ECM 5	Install Occupancy Sensor Lighting Controls	18,178	6.4	0.0	\$2,141.75	\$30,780.00	\$3,920.00	\$26,860.00	12.5	18,305
ECM 6	Install High/Low Lighting Controls	2,967	1.0	0.0	\$349.60	\$5,130.00	\$0.00	\$5,130.00	14.7	2,988

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

### ECM 5: Install Occupancy Sensor Lighting Controls

#### *Summary of Measure Economics*

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
18,178	6.4	0.0	\$2,141.75	\$30,780.00	\$3,920.00	\$26,860.00	12.5	18,305

#### *Measure Description*

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

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



## ECM 6: 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)
2,967	1.0	0.0	\$349.60	\$5,130.00	\$0.00	\$5,130.00	14.7	2,988

### 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 and interior corridors.

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 Plug Load Equipment Control - Vending Machines

Our recommendations for upgrades to existing lighting controls are summarized in Figure 19 below.

**Figure 19 – Summary of Plug Load Equipment Controls ECMs**

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Natural Gas 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>Plug Load Equipment Control - Vending Machine</b>			0.0	0.0	\$650.43	\$1,150.00	\$0.00	\$1,150.00	1.8	5,559
ECM 8	Vending Machine Control	5,521	0.0	0.0	\$650.43	\$1,150.00	\$0.00	\$1,150.00	1.8	5,559

### ECM 7: 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)
5,521	0.0	0.0	\$650.43	\$1,150.00	\$0.00	\$1,150.00	1.8	5,559

#### Measure Description

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

## 4.2 ECMs Evaluated But Not Recommended

The measures below have been evaluated by the auditor but are not recommended for implementation at the facility. Reasons for exclusion can be found in each measure description section.

**Figure 20 – Summary of Measures Evaluated, But Not Recommended**

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Gas Heating (HVAC/Process) Replacement</b>	0	0.0	254.0	\$2,347.40	\$111,517.93	\$6,000.00	\$105,517.93	45.0	29,736
Install High Efficiency Steam Boilers	0	0.0	254.0	\$2,347.40	\$111,517.93	\$6,000.00	\$105,517.93	45.0	29,736
<b>TOTALS</b>	0	0.0	254.0	\$2,347.40	\$111,517.93	\$6,000.00	\$105,517.93	45.0	29,736

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

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

### Install High Efficiency Steam Boilers

#### *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	254.0	\$2,347.40	\$111,517.93	\$6,000.00	\$105,517.93	45.0	29,736

#### *Measure Description*

We evaluated replacing the older steam boilers with high efficiency steam boilers. Significant improvements have been made in combustion technology resulting in increases in overall boiler efficiency. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

#### *Reasons for not Recommending*

The investment in replacement steam boilers is a big investment that would not be cost effective. Given the issues with leaks and the age of the entire steam system, it might be better to convert the steam system to a hydronic system with condensing boilers. The most notable efficiency improvement would be that condensing hydronic boilers can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies of approximately 85% and 87% (comparable to other high efficiency boilers) when the return water temperature is above 130°F. If the return water temperature drops below 130°F, the unit will enter “condensing mode” providing more efficient operation. Please be aware that condensing boilers are typically 10%-15% more expensive than standard high-efficiency boilers and should only be selected if the design conditions support “condensing mode” operation. The ideal target loop temperature can be optimized through the design process. In addition to determining the appropriate type of new high-efficiency boiler, we recommend consideration be made regarding the new unit size(s) and where appropriate, implementation of multiple (modular) boilers versus larger capacity units. We recommend that the site staff work with the design team to evaluate the heating load for the facility prior to replacing the boilers. The new boilers should be sized to meet the current heating requirements rather than simply installing boilers with the same capacity as the existing boilers. The capital cost of the project can generally be reduced if the overall boiler plant capacity can be

reduced. In addition, we recommend that the design team consider designing the plant using several lower capacity modular boilers. Configuring a boiler plant with several modular boilers, rather than one or two high-capacity boilers, results in a plant that can more efficiently match and serve the load, provide a high level of redundancy, reduce standby losses, and is more flexible to expand if the heating load increases in the future. Finally, we recommend working with the design team to determine if the updated boiler plant can be operated in such a way that the return water temperature is generally lower than 130°F so that condensing boilers could be used.

## 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.

### **Perform Proper Lighting Maintenance**

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

### **Develop a Lighting Maintenance Schedule**

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

### **Ensure Lighting Controls Are Operating Properly**

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

### **Turn Off Unneeded Motors**

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

### **Clean Evaporator/Condenser Coils on AC Systems**

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

### **Clean and/or Replace HVAC Filters**

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

### **Repair/Replace Steam Traps**

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

### **Perform 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>.

## **Water Conservation**

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

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

## 6 ON-SITE GENERATION MEASURES

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

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

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

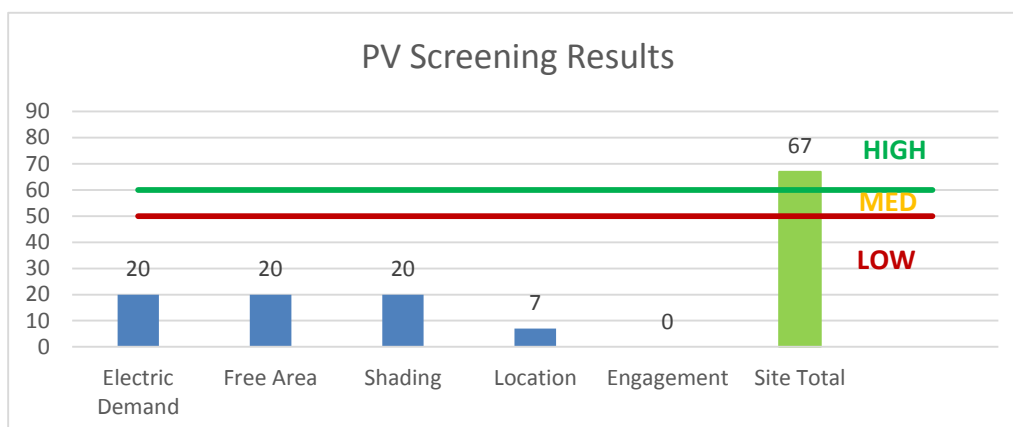
### 6.1 Photovoltaic

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

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has a High potential for installing a PV array. A PV array located on the roof of the main building may be feasible.

In order to be cost-effective, a solar PV array needs certain minimum criteria, such as flat or south-facing rooftop or other unshaded space on which to place the PV panels. In our opinion, the facility does appear not meet these minimum criteria for cost-effective PV installation. If the school is interested in expanding their existing system, we recommended a full feasibility study be conducted.

*Figure 21 - Photovoltaic Screening*





Potential	High	
System Potential	100	kW DC STC
Electric Generation	119,137	kWh/yr
Displaced Cost	\$10,360	/yr
Installed Cost	\$416,000	

Solar projects must register their projects in the SREC (Solar Renewable Energy Certificate) Registration Program (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 developed new solar projects and insight into future SREC pricing. Refer to Section 8.3 for additional information.

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

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

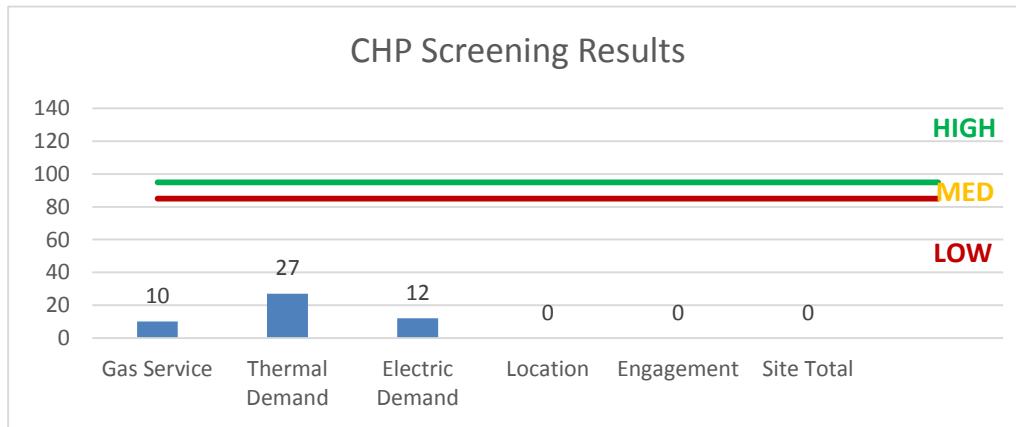
Combined heat and power (CHP) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric 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.

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

**Figure 22 - Combined Heat and Power Screening**



## 7 DEMAND RESPONSE

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

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

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

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

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

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

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

In our opinion this building is not a good candidate for DR.

## 8 PROJECT FUNDING / INCENTIVES

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

**Figure 23 - ECM Incentive Program Eligibility**

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x		x			
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x		x			
ECM 3	Retrofit Fixtures with LED Lamps	x		x			
ECM 4	Install LED Exit Signs						
ECM 5	Install Occupancy Sensor Lighting Controls	x		x			
ECM 6	Install High/Low Lighting Controls						
ECM 7	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 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 Direct Install

### Overview

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

### Incentives

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

### How to Participate

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

Detailed program descriptions and applications can be found at: [www.njcleanenergy.com/DI](http://www.njcleanenergy.com/DI).

### 8.3 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SRP prior to the start of construction 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. SRECs are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

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

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

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

## 8.4 Energy Savings Improvement Program

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

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

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

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

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



## 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 Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.11	317	0.0	\$37.33	\$351.00	\$60.00	7.80
Boiler Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
Boiler Room	1	Compact Fluorescent: pin based, 2 Lamp	Wall Switch	26	1,600	Relamp	No	1	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	11	1,600	0.01	28	0.0	\$3.25	\$53.75	\$0.00	16.53
Boiler Room	2	Exit Signs: Incandescent	Wall Switch	35	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.04	584	0.0	\$68.84	\$215.11	\$0.00	3.12
3rdFlr_CR 301	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.25	691	0.0	\$81.36	\$796.50	\$125.00	8.25
3rdFlr_StorageCloset	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.11	58	0.0	\$6.78	\$504.00	\$40.00	68.44
3rdFlr_CustodialCloset	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
3rdFlr_BoysRR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,991	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,991	0.06	227	0.0	\$26.70	\$150.40	\$30.00	4.51
3rdFlr_CR 302	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.25	691	0.0	\$81.36	\$796.50	\$125.00	8.25
3rdFlr_CR 313	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.25	691	0.0	\$81.36	\$796.50	\$125.00	8.25
3rdFlr_CR 312	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.25	691	0.0	\$81.36	\$796.50	\$125.00	8.25
3rdFlr_CR 303	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.25	691	0.0	\$81.36	\$796.50	\$125.00	8.25
3rdFlr_Rm 311 (Teachers Rm)	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$75.00	11.86
3rdFlr_Rm 311 (Teachers Rm)-RR	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	34	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	31	0.0	\$3.69	\$48.20	\$10.00	10.37
3rdFlr_CR 304	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.57	1,611	0.0	\$189.84	\$2,308.50	\$350.00	10.32
3rdFlr_CR 310	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.33	921	0.0	\$108.48	\$1,242.00	\$190.00	9.70
3rdFlr_CR 305	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.25	691	0.0	\$81.36	\$796.50	\$125.00	8.25
3rdFlr_CR 306	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.25	691	0.0	\$81.36	\$796.50	\$125.00	8.25
3rdFlr_CR 309	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,600	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,120	0.74	2,072	0.0	\$244.08	\$2,163.60	\$375.00	7.33
3rdFlr_CR 309-side room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
3rdFlr_CR 302	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.27	767	0.0	\$90.40	\$1,125.00	\$170.00	10.56
3rdFlr_Rm 308 (Faculty)	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$75.00	11.86
3rdFlr_Rm 308 (Faculty)-RR	1	Compact Fluorescent: pin based, 2 Lamp	Wall Switch	26	1,600	Relamp	No	1	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	11	1,600	0.01	28	0.0	\$3.25	\$53.75	\$0.00	16.53
3rdFlr_Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,120	0.08	230	0.0	\$27.12	\$420.40	\$65.00	13.10
3rdFlr_Special Services Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78

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
3rdFir_DM Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,600	0.01	32	0.0	\$3.79	\$35.90	\$5.00	8.14
3rdFir_DI Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78
2ndFir_Supply Closet/Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.11	58	0.0	\$6.78	\$504.00	\$40.00	68.44
2ndFir_Custodial Closet	1	Compact Fluorescent: pin based	Wall Switch	18	300	Relamp	No	1	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	10	300	0.01	3	0.0	\$0.35	\$53.75	\$0.00	155.58
2ndFir_CR 201	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
2ndFir_Boys RRR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,120	0.08	230	0.0	\$27.12	\$420.40	\$65.00	13.10
2ndFir_CR 215	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
2ndFir_CR 202	1	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.03	93	0.0	\$10.95	\$53.75	\$5.00	4.45
2ndFir_Book Storage	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	300	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	210	0.26	136	0.0	\$15.99	\$1,456.20	\$90.00	85.46
2ndFir_CR 214	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
2ndFir_CR 213	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
2ndFir_CR 213	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.06	161	0.0	\$18.95	\$413.60	\$20.00	20.77
2ndFir_CR 213-RR	1	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.03	93	0.0	\$10.95	\$53.75	\$5.00	4.45
2ndFir_CR 213-Storage	2	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	2	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.07	35	0.0	\$4.11	\$107.51	\$10.00	23.75
2ndFir_CR 204	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.33	921	0.0	\$108.48	\$1,242.00	\$190.00	9.70
2ndFir_CR 205	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.33	921	0.0	\$108.48	\$1,242.00	\$190.00	9.70
2ndFir_CR 206	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.33	921	0.0	\$108.48	\$1,242.00	\$190.00	9.70
2ndFir_CR 212	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
2ndFir_CR 211	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
2ndFir_CR 211	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
2ndFir_CR 207	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
2ndFir_CR 208	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
2ndFir_CR 210	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.33	921	0.0	\$108.48	\$1,242.00	\$190.00	9.70
2ndFir_Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,120	0.08	230	0.0	\$27.12	\$420.40	\$65.00	13.10
2ndFir_Science Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78

	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	
2ndFlr_Trans/Security	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78	
2ndFlr_Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,600	0.02	64	0.0	\$7.59	\$71.80	\$10.00	8.14	
2ndFlr_Custodial Rm	2	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	2	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.07	186	0.0	\$21.90	\$107.51	\$10.00	4.45	
2ndFlr_CR 220	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79	
2ndFlr_CR 221	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79	
2ndFlr_CR 228	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.41	1,151	0.0	\$135.60	\$1,687.50	\$255.00	10.56	
2ndFlr_CR 222	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.44	1,228	0.0	\$144.64	\$1,746.00	\$265.00	10.24	
2ndFlr_CR 227	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.33	921	0.0	\$108.48	\$1,242.00	\$190.00	9.70	
2ndFlr_CR 227-side room	2	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	2	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.07	186	0.0	\$21.90	\$107.51	\$10.00	4.45	
2ndFlr_CR 223	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79	
2ndFlr_CR 224	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79	
2ndFlr_CR 225	30	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	30	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.43	1,206	0.0	\$142.11	\$2,697.00	\$360.00	16.45	
2ndFlr_CR 225-storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75	
2ndFlr_CR 225-storage	1	Compact Fluorescent: screw-in , 2 Lamp,	Wall Switch	18	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.01	3	0.0	\$0.35	\$107.51	\$0.00	311.15	
2ndFlr_CR 237	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78	
2ndFlr_CR 237	24	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.34	965	0.0	\$113.68	\$1,941.60	\$260.00	14.79	
2ndFlr_FacultyRm	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,600	0.05	129	0.0	\$15.18	\$143.60	\$20.00	8.14	
2ndFlr_FacultyRm-RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78	
2ndFlr_CR 236	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79	
2ndFlr_CR 235	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.49	1,381	0.0	\$162.72	\$1,863.00	\$285.00	9.70	
2ndFlr_BoysRR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78	
2ndFlr_Janitor Closet	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75	
2ndFlr_Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.08	230	0.0	\$27.12	\$445.50	\$65.00	14.03	
2ndFlr_CR 230	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.49	1,381	0.0	\$162.72	\$1,863.00	\$285.00	9.70	
2ndFlr_CR 234	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.49	1,381	0.0	\$162.72	\$1,863.00	\$285.00	9.70	

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
2ndFlr_CR 231	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.49	1,381	0.0	\$162.72	\$1,863.00	\$285.00	9.70
2ndFlr_CR 232	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.49	1,381	0.0	\$162.72	\$1,863.00	\$285.00	9.70
2ndFlr_CR 233 (Bio Lab)	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.82	2,302	0.0	\$271.20	\$3,375.00	\$510.00	10.56
2ndFlr_CR 233 (Bio Lab)-Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.08	43	0.0	\$5.09	\$445.50	\$30.00	81.71
2ndFlr_CR 233 (Bio Lab)-Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.08	43	0.0	\$5.09	\$445.50	\$30.00	81.71
1stFlr_Hall	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.49	1,381	0.0	\$162.72	\$1,863.00	\$180.00	10.34
1stFlr_CR 133	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
1stFlr_CR 132	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
1stFlr_CR 134	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
1stFlr_CR 131	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
1stFlr_CR 135	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
1stFlr_CR 130	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
1stFlr_Boys RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
1stFlr_Janitor Closet	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
1stFlr_Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
1stFlr_CR 136	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.66	1,841	0.0	\$216.96	\$2,484.00	\$380.00	9.70
1stFlr_Faculty Rm	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.14	384	0.0	\$45.20	\$562.50	\$85.00	10.56
1stFlr_Faculty Rm-RR	1	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.03	93	0.0	\$10.95	\$53.75	\$5.00	4.45
1stFlr_CR 137 (Art Rm)	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.74	2,072	0.0	\$244.08	\$2,929.50	\$445.00	10.18
1stFlr_CR 137 (Art Rm)	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
1stFlr_CR 137 (Art Rm) - Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
1stFlr_CR 137 (Art Rm) - BlackRm	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,600	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.08	217	0.0	\$25.58	\$234.00	\$20.00	8.37
1stFlr_StorageRm (OppositeRm137)	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.11	58	0.0	\$6.78	\$504.00	\$40.00	68.44
1stFlr_CR 129	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,600	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,120	0.53	1,486	0.0	\$175.04	\$1,586.47	\$290.00	7.41
1stFlr_CR 129-Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75

	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	
1stFlr_TV Production Rm	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$75.00	11.86	
1stFlr_TV Production Rm-Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	300	0.04	23	0.0	\$2.68	\$117.00	\$20.00	36.16	
1stFlr_Tech Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,600	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,120	0.19	540	0.0	\$63.65	\$650.53	\$115.00	8.41	
1stFlr_Tech Room	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
1stFlr_Tech Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.08	230	0.0	\$27.12	\$445.50	\$65.00	14.03	
1stFlr_Tech Room-Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78	
1stFlr_CR 125	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.08	230	0.0	\$27.12	\$445.50	\$65.00	14.03	
1stFlr_CR 125	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.08	230	0.0	\$27.12	\$445.50	\$65.00	14.03	
1stFlr_CR 125	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.08	230	0.0	\$27.12	\$445.50	\$65.00	14.03	
1stFlr_CR 125	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,120	0.08	230	0.0	\$27.12	\$420.40	\$65.00	13.10	
1stFlr_CR 125	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.27	767	0.0	\$90.40	\$1,125.00	\$170.00	10.56	
1stFlr_Womens RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01	
1stFlr_CR 128	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.82	2,302	0.0	\$271.20	\$3,375.00	\$510.00	10.56	
1stFlr_Storage	2	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	300	None	No	2	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	300	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
1stFlr_CR 121	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.66	1,841	0.0	\$216.96	\$2,484.00	\$380.00	9.70	
1stFlr_Mens RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,991	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,991	0.04	151	0.0	\$17.80	\$117.00	\$20.00	5.45	
1stFlr_Voodsons Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78	
1stFlr_Voodsons Office-Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	300	0.02	11	0.0	\$1.34	\$58.50	\$10.00	36.16	
Kitchen_Custodial Rm	1	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.03	93	0.0	\$10.95	\$53.75	\$5.00	4.45	
Kitchen_Locker Rm	1	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	None	No	1	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
Kitchen_Storage	2	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	2	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.07	35	0.0	\$4.11	\$107.51	\$10.00	23.75	
Kitchen_Main Area	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	26	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.71	1,995	0.0	\$235.04	\$2,871.00	\$435.00	10.36	
Kitchen_Dishwasher Area	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$75.00	11.86	
Kitchen_Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78	
Kitchen_Fume Hood	4	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	4	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.13	372	0.0	\$43.79	\$215.01	\$20.00	4.45	

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
Kitchen_Snack Store	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,600	0.05	129	0.0	\$15.18	\$143.60	\$20.00	8.14
1stFlr_School Store	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.09	241	0.0	\$28.42	\$485.40	\$30.00	16.02
1stFlr_Cafeteria	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
1stFlr_Cafeteria	50	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	50	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	1.37	3,836	0.0	\$452.01	\$5,085.00	\$780.00	9.52
1stFlr_Dance Room	72	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	72	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	1.97	5,524	0.0	\$650.89	\$6,372.00	\$1,000.00	8.25
1stFlr_Dance Room	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
1stFlr_Boys RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
1stFlr_CustodialCloset	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	300	0.02	11	0.0	\$1.34	\$58.50	\$10.00	36.16
1stFlr_MediaCenter	70	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	70	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	1.91	5,371	0.0	\$632.81	\$6,255.00	\$980.00	8.34
1stFlr_MediaCenter	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
1stFlr_MediaCenter-Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.08	43	0.0	\$5.09	\$445.50	\$30.00	81.71
Kitchen_Walk-In Cooler	3	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	3	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.10	279	0.0	\$32.84	\$161.26	\$15.00	4.45
1stFlr_MediaCenter-Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.08	43	0.0	\$5.09	\$445.50	\$30.00	81.71
1stFlr_ChildStudy Team	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.22	614	0.0	\$72.32	\$738.00	\$115.00	8.61
1stFlr_NursesOffice	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.36	997	0.0	\$117.52	\$1,300.50	\$200.00	9.36
1stFlr_NursesOffice-RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
1stFlr_NursesOffice-Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
1stFlr_NursesOffice-Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78
1stFlr_Rm102-GuidanceOffice	23	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	23	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.63	1,765	0.0	\$207.92	\$2,425.50	\$370.00	9.89
1stFlr_SafeRm	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
1stFlr_SafeRm-Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$75.00	11.86
1stFlr_SafeRm-Office-RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
1stFlr_SafeRm-EndOffice	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.16	460	0.0	\$54.24	\$621.00	\$95.00	9.70
1stFlr_SafeRm-EndOffice-RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
1stFlr_SafeRm-Office-Closet	1	Compact Fluorescent: screw-in , 1 Lamp,	Wall Switch	13	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.00	1	0.0	\$0.14	\$53.75	\$0.00	377.83



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
1stFir_Conf Room	22	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	22	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.32	884	0.0	\$104.21	\$1,869.80	\$250.00	15.54
1stFir_CR 108	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.26	724	0.0	\$85.26	\$1,456.20	\$195.00	14.79
1stFir_CR 108-Storage	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	300	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	300	0.01	6	0.0	\$0.65	\$48.20	\$10.00	58.74
1stFir_Main Office	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.33	921	0.0	\$108.48	\$1,242.00	\$190.00	9.70
1stFir_PrincipalsOffice	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.19	537	0.0	\$63.28	\$679.50	\$105.00	9.08
1stFir_PrincipalsOffice-Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
1stFir_PrincipalsOffice-RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
1stFir_MainOffice-RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
1stFir_MainOffice-Storage	1	Compact Fluorescent: screw-in , 1 Lamp,	Wall Switch	13	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.00	1	0.0	\$0.14	\$53.75	\$0.00	377.83
1stFir_MainOffice-Safe	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,600	0.01	32	0.0	\$3.79	\$35.90	\$5.00	8.14
1stFir_BookkeeperOffice	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
1stFir_MailRoom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
1stFir_CopyRoom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.08	230	0.0	\$27.12	\$445.50	\$65.00	14.03
1stFir_VP Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
1stFir_End Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$75.00	11.86
1stFir_End Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
1stFir_End Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
1stFir_CR 109	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.33	921	0.0	\$108.48	\$1,242.00	\$190.00	9.70
1stFir_CR 109-Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
1stFir_Girls RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
1stFir_Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,120	0.08	230	0.0	\$27.12	\$420.40	\$65.00	13.10
BandRmArea_RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
BandRmArea_CustodialCloset	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
BandRmArea_BandRm	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	36	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.98	2,762	0.0	\$325.44	\$3,996.00	\$605.00	10.42
BandRmArea_BandRm	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00



	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	
BandRmArea_Draetr Rm	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78	
BandRmArea_Draetr Rm-Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.08	230	0.0	\$27.12	\$445.50	\$65.00	14.03	
BandRmArea_Storage 1-4	1	Compact Fluorescent: pin based, 2 Lamp	Wall Switch	26	300	Relamp	No	1	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	11	300	0.01	5	0.0	\$0.61	\$53.75	\$0.00	88.16	
BandRmArea_Girls RR	1	Exit Signs: Incandescent	Wall Switch	35	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.02	292	0.0	\$34.42	\$107.56	\$0.00	3.12	
BandRmArea_Backstage	2	Incandescent: A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	2	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.07	186	0.0	\$21.90	\$107.51	\$10.00	4.45	
BandRmArea_Backstage	1	Incandescent: A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.03	93	0.0	\$10.95	\$53.75	\$5.00	4.45	
BandRmArea_Corridor	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
BandRmArea_Corridor	1	Incandescent: A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.03	93	0.0	\$10.95	\$53.75	\$5.00	4.45	
1stFlr_Stage	150	Incandescent: A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	150	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	4.97	13,938	0.0	\$1,642.18	\$8,062.95	\$750.00	4.45	
1stFlr_Backstage(Right)	1	Incandescent: A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.03	93	0.0	\$10.95	\$53.75	\$5.00	4.45	
1stFlr_Backstage(Right)	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
1stFlr_Auditorium (Front)	32	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,600	Relamp	Yes	32	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,120	1.54	4,322	0.0	\$509.19	\$4,664.27	\$850.00	7.49	
1stFlr_Auditorium (Front)	13	Halogen Incandescent: Spot Lights	Wall Switch	300	1,600	None	No	13	Halogen Incandescent: Spot Lights	Wall Switch	300	1,600	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
1stFlr_Auditorium (Front)	5	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
GymArea_JanitorCloset	1	Incandescent: A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75	
GymArea_BoysRR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01	
GymArea_Girls RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01	
GymArea_Gym	24	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Occupancy Sensor	120	1,991	Relamp	No	24	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,991	0.98	3,407	0.0	\$401.37	\$2,283.20	\$480.00	4.49	
GymArea_Gym	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
GymArea_Girls Locker	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.44	1,228	0.0	\$144.64	\$1,746.00	\$265.00	10.24	
GymArea_Girls Locker	2	Compact Fluorescent: pin based	Wall Switch	13	1,600	Relamp	No	2	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	10	1,600	0.00	13	0.0	\$1.52	\$107.51	\$0.00	70.84	
GymArea_Girls Locker	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
GymArea_Girls Locker RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01	
GymArea_Girls Locker - Storage	3	Incandescent: A Lamp (60 W)	Wall Switch	60	300	Relamp	No	3	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.10	52	0.0	\$6.16	\$161.26	\$15.00	23.75	
GymArea_GirlsLocker_Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,600	0.02	64	0.0	\$7.59	\$71.80	\$10.00	8.14	

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
GymArea_GirlsLocker_Office_RR	1	Compact Fluorescent: pin based, 2 Lamp	Wall Switch	26	1,600	Relamp	No	1	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	11	1,600	0.01	28	0.0	\$3.25	\$53.75	\$0.00	16.53
GymArea_GirlsLocker_Office-Storage1&2	2	Compact Fluorescent: screw-in , 1 Lamp,	Wall Switch	18	300	Relamp	No	2	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.01	6	0.0	\$0.69	\$107.51	\$0.00	155.58
GymArea_AthleticDirector	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.16	460	0.0	\$54.24	\$621.00	\$95.00	9.70
GymArea_AthleticDirector-RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
GymArea_AthleticDirector-Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
GymArea_GymStorage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.11	58	0.0	\$6.78	\$504.00	\$40.00	68.44
GymArea_AthleticTrainersOffice	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.22	614	0.0	\$72.32	\$738.00	\$115.00	8.61
GymArea_AthleticTrainersOffice	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
GymArea_AthleticTrainersOffice	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
GymArea_CoachesOffice	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$75.00	11.86
GymArea_CoachesOffice-Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
GymArea_BoysLocker	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
GymArea_BoysLocker-Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
GymArea_BoysLocker	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.38	1,074	0.0	\$126.56	\$1,359.00	\$210.00	9.08
GymArea_BoysLocker	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
GymArea_ShowerArea	6	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	None	No	6	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
GymArea_TeamRm	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.22	614	0.0	\$72.32	\$738.00	\$115.00	8.61
GymArea_TeamRm	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
GymArea_TeamRm	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
GymArea_TeamRm-Storage	2	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	2	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.07	35	0.0	\$4.11	\$107.51	\$10.00	23.75
GymArea_TeamRm-Storage	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	300	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	300	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
GymArea_TeamRm-Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	300	0.02	11	0.0	\$1.34	\$58.50	\$10.00	36.16
GymArea_TeamRm-RR	1	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.03	93	0.0	\$10.95	\$53.75	\$5.00	4.45
GymArea_Coaches Lounge	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
GymArea_FanRoom	3	Compact Fluorescent: pin based	Wall Switch	13	1,600	Relamp	No	3	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	10	1,600	0.01	19	0.0	\$2.28	\$161.26	\$0.00	70.84

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
GymArea_FanRoom	2	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	2	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.07	186	0.0	\$21.90	\$107.51	\$10.00	4.45
GymArea_FanRoom	1	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	None	No	1	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
GymArea_JanitorCloset	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
GymArea_HealthRoom	30	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	Yes	30	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,120	0.43	1,206	0.0	\$142.11	\$2,697.00	\$360.00	16.45
Basement_ElectricalRoom	1	Incandescent A Lamp (60 W)	Wall Switch	60	1,600	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	1,600	0.03	93	0.0	\$10.95	\$53.75	\$5.00	4.45
Basement_Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.11	58	0.0	\$6.78	\$504.00	\$40.00	68.44
Basement_Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
Basement_CustodialOffice	2	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	None	No	2	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Basement_CustodialOffice	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	1,600	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,600	0.01	32	0.0	\$3.79	\$35.90	\$5.00	8.14
Basement_CustodialOffice-RR	1	Compact Fluorescent: pin based	Wall Switch	18	1,600	Relamp	No	1	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	10	1,600	0.01	16	0.0	\$1.84	\$53.75	\$0.00	29.17
Basement_ROT_C Room	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.46	1,304	0.0	\$153.68	\$1,804.50	\$275.00	9.95
Basement_ROT_C Room	2	Exit Signs: Incandescent	Wall Switch	35	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.04	584	0.0	\$68.84	\$215.11	\$0.00	3.12
Basement_UniformCloset	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	210	0.11	58	0.0	\$6.78	\$504.00	\$40.00	68.44
Basement_UniformCloset	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	300	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	300	0.05	24	0.0	\$2.85	\$143.60	\$20.00	43.44
Basement_UniformCloset	1	Compact Fluorescent: screw-in, 1 Lamp,	Wall Switch	23	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	11	300	0.01	4	0.0	\$0.49	\$53.75	\$0.00	110.20
Basement_ROT_C-RR	1	Compact Fluorescent: pin based, 2 Lamp	Wall Switch	26	1,600	Relamp	No	1	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	11	1,600	0.01	28	0.0	\$3.25	\$53.75	\$0.00	16.53
Basement_ROT_C	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78
Basement_ROT_C-Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$75.00	11.86
Basement_BackOffice	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78
Basement_Office-RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.04	121	0.0	\$14.31	\$117.00	\$20.00	6.78
Basement_Office-Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	300	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	300	0.04	23	0.0	\$2.68	\$117.00	\$20.00	36.16
Basement_PaperCopyRoom	7	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	None	No	7	LED Screw-In Lamps: A type - 9.5W	Wall Switch	10	1,600	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Basement_Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
Basement_FSS Room 003	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.33	921	0.0	\$108.48	\$1,242.00	\$190.00	9.70
Basement_FSS Room 003-Storage	7	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	7	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.23	122	0.0	\$14.37	\$376.27	\$35.00	23.75

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
Basement_Girls-RR	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
Basement_Boys-RR	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.02	59	0.0	\$6.94	\$96.40	\$20.00	11.01
Basement_Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
Basement_Storage	1	Incandescent A Lamp (60 W)	Wall Switch	60	300	Relamp	No	1	LED Screw-In Lamps: A type lamp	Wall Switch	10	300	0.03	17	0.0	\$2.05	\$53.75	\$5.00	23.75
Basement_Endroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.01	29	0.0	\$3.47	\$48.20	\$10.00	11.01
Basement_Hallway	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.36	997	0.0	\$117.52	\$1,300.50	\$130.00	9.96
Basement_Hallway	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Basement_Hallway	2	Exit Signs: Incandescent	Wall Switch	35	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.04	584	0.0	\$68.84	\$215.11	\$0.00	3.12
1stFir_CenterWingHall	6	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	6	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
1stFir_CenterWingHall	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.82	2,302	0.0	\$271.20	\$3,375.00	\$300.00	11.34
1stFir_CenterWing-EndStairwell	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.08	230	0.0	\$27.12	\$445.50	\$30.00	15.32
2ndFir_CenterWingHall	35	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	35	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.96	2,685	0.0	\$316.40	\$3,937.50	\$350.00	11.34
2ndFir_CenterWingHall	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
2ndFir_CenterWingHall	1	Exit Signs: Incandescent	Wall Switch	35	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.02	292	0.0	\$34.42	\$107.56	\$0.00	3.12
2ndFir_MainHall	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
2ndFir_MainHall	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	26	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.71	1,995	0.0	\$235.04	\$2,871.00	\$260.00	11.11
3rdFir_MainHall	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
3rdFir_MainHall	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.60	1,688	0.0	\$198.88	\$2,367.00	\$220.00	10.80
Stair A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$40.00	12.83
Stair C	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$40.00	12.83
1stFir_BandRm/Auditorium Hall	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
1stFir_BandRm/Auditorium Hall	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.14	384	0.0	\$45.20	\$562.50	\$50.00	11.34
1stFir_Auditorium/Vestibule Hall	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
1stFir_Auditorium/Vestibule Hall	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.16	460	0.0	\$54.24	\$621.00	\$60.00	10.34
1stFir_Auditorium/Vestibule	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,600	0.02	61	0.0	\$7.15	\$58.50	\$10.00	6.78

	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		
1stFlr_GymHall	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.19	537	0.0	\$63.28	\$679.50	\$70.00	9.63		
1stFlr_GymHall	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
1stFlr_GymHall	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	1,120	0.15	429	0.0	\$50.60	\$649.20	\$0.00	12.83		
1stFlr_Main Hall	5	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
1stFlr_Main Hall	33	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	33	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.90	2,532	0.0	\$298.32	\$3,550.50	\$330.00	10.80		
1stFlr_Main Hall	2	Exit Signs: Incandescent	Wall Switch	35	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.04	584	0.0	\$68.84	\$215.11	\$0.00	3.12		
1stFlr_Cafeteria Stairwell	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	1,600	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,600	0.03	90	0.0	\$10.62	\$48.20	\$10.00	3.60		
1stFlr_Stair B	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
1stFlr_Stair B	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,120	0.16	460	0.0	\$54.24	\$621.00	\$60.00	10.34		
1stFlr_Stair B	1	Compact Fluorescent: pin based, 2 Lamp	Wall Switch	26	1,600	Relamp	No	1	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	11	1,600	0.01	28	0.0	\$3.25	\$53.75	\$0.00	16.53		
1stFlr_CenterEntry	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.11	307	0.0	\$36.16	\$504.00	\$75.00	11.86		
Exterior_Side of Bldg	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	40	4,380	None	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	40	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
Exterior_Flood (generator)	5	LED - Fixtures: Architectural Flood/Spot Luminaire	Wall Switch	40	52	None	No	5	LED - Fixtures: Architectural Flood/Spot Luminaire	Wall Switch	40	52	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
Exterior_Flood (generator)	6	LED - Fixtures: Architectural Flood/Spot Luminaire	Wall Switch	40	4,380	None	No	6	LED - Fixtures: Architectural Flood/Spot Luminaire	Wall Switch	40	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
Exterior_Ceiling fixture	3	LED - Fixtures: Ceiling Mount	Wall Switch	40	4,380	None	No	3	LED - Fixtures: Ceiling Mount	Wall Switch	40	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
CenterEntryStairs	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
CenterEntryStairs	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,844	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,991	0.08	409	0.0	\$48.21	\$445.50	\$30.00	8.62		
Exterior_MH-Wallpack	4	Metal Halide: (1) 70W Lamp	Wall Switch	95	4,380	Fixture Replacement	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	24	4,380	0.19	1,436	0.0	\$169.14	\$1,562.71	\$400.00	6.87		
Exterior_Wall	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	40	4,380	None	No	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	40	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
Exterior_Generator	3	Compact Fluorescent: pin based	Wall Switch	23	4,380	Relamp	No	3	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	11	4,380	0.02	181	0.0	\$21.36	\$161.26	\$0.00	7.55		
Exterior_Wall	16	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	40	4,380	None	No	16	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	40	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00		
Exterior_Flood (generator)	13	Incandescent: A Lamp (60 W)	Wall Switch	60	52	Relamp	No	13	LED Screw-In Lamps: A type lamp	Wall Switch	10	52	0.43	39	0.0	\$4.63	\$698.79	\$65.00	137.02		
Exterior_Wall	2	Compact Fluorescent: pin based	Wall Switch	23	4,380	Relamp	No	2	LED Screw-In Lamps: CFL Pin-Based Replacement	Wall Switch	11	4,380	0.02	121	0.0	\$14.24	\$107.51	\$0.00	7.55		
Exterior_ExteriorSign	2	Linear Fluorescent - T8HO: 8' T8HO (86W) - 2L	Wall Switch	160	4,380	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,380	0.17	1,320	0.0	\$155.49	\$117.00	\$20.00	0.62		
Exterior_Shed	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,380	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,066	0.22	1,680	0.0	\$197.98	\$738.00	\$115.00	3.15		

Existing Conditions						Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Exterior_PoleLight	2	Metal Halide: (1) 400W Lamp	Wall Switch	458	4,380	Fixture Replacement	No	2	LED - Fixtures: Outdoor Post-Mount	Wall Switch	115	4,380	0.45	3,460	0.0	\$407.71	\$1,146.60	\$10.00	2.79

## Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Restrooms	12	Exhaust Fan	0.3	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Kitchen	5	Exhaust Fan	1.0	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Boiler Room	Boiler	2	Boiler Feed Water Pump	0.5	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Boiler Room	Boiler	2	Combustion Air Fan	0.5	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
CR137	CR 137, end Art Room	1	Supply Fan	0.5	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	Kitchen and Cafeteria	1	Supply Fan	0.5	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 227	Room 227	1	Exhaust Fan	1.0	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 225	Room 225	1	Exhaust Fan	1.0	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Bldg	rooms	24	Ventilation Fan	0.5	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Locker Room	Locker Room	2	Ventilation Fan	0.8	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

## Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Windows	Classrooms, Offices	52	Window AC	1.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Int/Ext	Tech Room	1	Split-System Air-Source HP	2.77	20.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Int/Ext	IT Office	1	Split-System Air-Source HP	1.88	0.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Int/Ext	Server Room	1	Split-System Air-Source HP	1.88	0.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Lower Roof	Three Classrooms	1	Packaged Terminal AC	7.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Team Room	Team Room	1	Electric Resistance Heat		17.06	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

## Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Whole Bldg	2	Forced Draft Steam Boiler	3,000.00	Yes	2	Forced Draft Steam Boiler	3,000.00	81.00%	Et	0.00	0	254.0	\$2,347.40	\$111,517.93	\$6,000.00	44.95

## DHW Inventory & Recommendations

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

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

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
Kitchen	1	Medium Temp Freezer (0F to 30F)	No	No	No	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Medium Temp Freezer (0F to 30F)	No	No	No	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Low Temp Freezer (-35F to -5F)	No	No	No	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

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

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



### Cooking Equipment Inventory & Recommendations

Existing Conditions				Proposed Conditions	Energy Impact & Financial Analysis						
Location	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	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Insulated Food Holding Cabinet (3/4 Size)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Insulated Food Holding Cabinet (3/4 Size)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Gas Griddle (4 Feet Width)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Gas Steamer	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Gas Fryer	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	2	Gas Rack Oven (Single)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Dishwasher Inventory & Recommendations


Existing Conditions						Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Dishwasher Type	Water Heater Fuel Type	Booster Heater Fuel Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Payback w/ Incentives in Years
Kitchen	1	Single Tank Conveyor (High Temp)	Natural Gas	N/A	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?
various	60	Projector	300.0	
various	54	Smartboard	300.0	
various	20	Laptops	100.0	
various	6	Photocopier	500.0	
various	6	Refrigerator	500.0	
various	12	microwave	1,000.0	
various	167	desktop PC	400.0	
various	31	desktop printer	50.0	
various	7	Tube TV	400.0	
various	2	LCD TV	250.0	
various	11	mini-fridge	300.0	
various	2	shredder	500.0	
custodian	1	Washer	500.0	
custodian	1	Strack /Dryer	2,000.0	

## Vending Machine Inventory & Recommendations

Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis							
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Snack Room	3	Refrigerated	Yes	0.00	4,836	0.0	\$569.72	\$690.00	\$0.00	1.21
Snack Room	2	Non-Refrigerated	Yes	0.00	685	0.0	\$80.71	\$460.00	\$0.00	5.70



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## ENERGY STAR® Statement of Energy Performance

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**ENERGY STAR®**  
Score<sup>1</sup>

**Hillside High School**

**Primary Property Type:** K-12 School  
**Gross Floor Area (ft²):** 157,000  
**Built:** 1939

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

## Property & Contact Information

<b>Property Address</b> Hillside High School 1085 Liberty Avenue Hillside, New Jersey 07205	<b>Property Owner</b> Hillside Board of Education 195 Virginia Street Hillside, NJ 07205 908-352-7664	<b>Primary Contact</b> Dance Gonzalez 195 Virginia Street Hillside, NJ 07205 908-352-7664 ext 6429 dgonzalez@hillsidek12.org
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Property ID: 6288726

### Energy Consumption and Energy Use Intensity (EUI)

<b>Site EUI</b>	<b>Annual Energy by Fuel</b>	<b>National Median Comparison</b>
76.2 kBtu/ft²	Electric - Grid (kBtu) 1,825,984 (15%)	National Median Site EUI (kBtu/ft²) 109
	Natural Gas (kBtu) 9,658,700 (81%)	National Median Source EUI (kBtu/ft²) 149
	Electric - Solar (kBtu) 473,039 (4%)	% Diff from National Median Source EUI -30%
<b>Source EUI</b>		<b>Annual Emissions</b>
104.1 kBtu/ft²		Greenhouse Gas Emissions (Metric Tons CO2e/year) 716

**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)