



# Local Government Energy Audit: Energy Audit Report



Copyright ©2018 TRC Energy Services. All rights reserved.

Reproduction or distribution of the whole, or any part of the contents of this document without written permission of TRC is prohibited. Neither TRC nor any of its employees makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any data, information, method, product or process disclosed in this document, or represents that its use will not infringe upon any privately-owned rights, including but not limited to, patents, trademarks or copyrights.

## *Chesterfield Elementary School*

**Chesterfield Township**

30 Saddle Way

Chesterfield, New Jersey 08515

December 17, 2018

Final Report by:

**TRC Energy Services**

## Disclaimer

---

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

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

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

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

# Table of Contents

---

<b>1</b>	<b>Executive Summary.....</b>	<b>1</b>
1.1	Facility Summary .....	1
1.2	Your Cost Reduction Opportunities.....	1
	Energy Conservation Measures.....	1
	Energy Efficient Practices .....	3
	On-Site Generation Measures.....	3
1.3	Implementation Planning.....	4
<b>2</b>	<b>Facility Information and Existing Conditions .....</b>	<b>5</b>
2.1	Project Contacts .....	5
2.2	General Site Information.....	5
2.3	Building Occupancy .....	5
2.4	Building Envelope .....	6
2.5	On-Site Generation.....	6
2.6	Energy-Using Systems .....	6
	Lighting System .....	7
	Ground Source Heat Pump Air Conditioning and Heating System (GSHP) .....	8
	Direct Expansion Air Conditioning System (DX) .....	9
	Ventilation System .....	10
	Domestic Hot Water Heating System.....	10
	Refrigeration .....	11
	Building Plug Load .....	11
2.7	Water-Using Systems .....	11
<b>3</b>	<b>Site Energy Use and Costs.....</b>	<b>12</b>
3.1	Total Cost of Energy .....	12
3.2	Electricity Usage .....	13
3.3	Natural Gas Usage .....	14
3.4	Benchmarking.....	15
3.5	Energy End-Use Breakdown .....	17
<b>4</b>	<b>Energy Conservation Measures .....</b>	<b>18</b>
4.1	Recommended ECMs .....	18
4.1.1	Lighting Upgrades.....	19
	ECM 1: Install LED Fixtures .....	19
	ECM 2: Retrofit Fixtures with LED Lamps .....	20
4.1.2	Lighting Control Measures .....	21
	ECM 3: Install Occupancy Sensor Lighting Controls .....	21
	ECM 4: Install High/Low Lighting Controls .....	22
4.1.3	Plug Load Equipment Control - Vending Machines.....	23
	ECM 5: Vending Machine Control .....	23
<b>5</b>	<b>Energy Efficient Practices .....</b>	<b>24</b>

Perform Regular Lighting Maintenance .....	24
Develop a Lighting Maintenance Schedule .....	24
Ensure Lighting Controls Are Operating Properly .....	24
Perform Routine Motor Maintenance .....	24
Practice Use of Thermostat Schedules and Temperature Resets .....	25
Clean Evaporator/Condenser Coils on AC Systems .....	25
Perform Regular Furnace Maintenance .....	25
Plug Load Controls.....	25
Water Conservation .....	25
<b>6 On-Site Generation Measures .....</b>	<b>26</b>
6.1 Photovoltaic.....	27
6.2 Combined Heat and Power .....	28
<b>7 Demand Response .....</b>	<b>29</b>
<b>8 Project Funding / Incentives .....</b>	<b>30</b>
8.1 SmartStart .....	31
8.2 SREC Registration Program.....	32
8.3 Energy Savings Improvement Program .....	33
<b>9 Energy Purchasing and Procurement Strategies .....</b>	<b>34</b>
9.1 Retail Electric Supply Options.....	34
9.2 Retail Natural Gas Supply Options .....	34

Appendix A: Equipment Inventory & Recommendations

Appendix B: ENERGY STAR® Statement of Energy Performance

# Table of Figures

---

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

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

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

Figure 4 – Photovoltaic Potential..... 3

Figure 5 – Project Contacts ..... 5

Figure 6 - Building Schedule..... 5

Figure 7 – West Facade ..... 6

Figure 8 – South Facade..... 6

Figure 9 – Typical Fixtures..... 7

Figure 10 – Cafetorium Fixtures..... 7

Figure 11 – Gym HID Fixtures..... 7

Figure 12 – GSHP Circulation Pumps ..... 8

Figure 13 – Water Source HP (in attic over classroom wing)..... 8

Figure 14 – Pump Variable Speed Drives ..... 8

Figure 15 – Gym RTU..... 9

Figure 16 – Ductless Mini-Split ..... 9

Figure 17 – ERV on Roof..... 10

Figure 18 – ERV in Attic..... 10

Figure 19 – A.O. Smith Boiler ..... 10

Figure 20 – Kitchen DHW heater..... 10

Figure 21 - Utility Summary ..... 12

Figure 22 - Energy Cost Breakdown ..... 12

Figure 23 - Electric Usage & Demand..... 13

Figure 24 - Electric Usage & Demand..... 13

Figure 25 - Natural Gas Usage..... 14

Figure 26 - Natural Gas Usage..... 14

Figure 27 - Energy Use Intensity Comparison – Existing Conditions..... 15

Figure 28 - Energy Use Intensity Comparison – Following Installation of Recommended Measures ..... 15

Figure 29 - Energy Balance (% and kBtu/SF) ..... 17

Figure 30 – Summary of Recommended ECMs..... 18

Figure 31 – Summary of Lighting Upgrade ECMs..... 19

Figure 32 – Summary of Lighting Control ECMs ..... 21

Figure 33 - Summary of Plug Load Equipment Control ECMs..... 23

Figure 34 - Photovoltaic Screening ..... 27

Figure 35 - Combined Heat and Power Screening ..... 28

Figure 36 - ECM Incentive Program Eligibility..... 30

# I EXECUTIVE SUMMARY

---

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

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

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey 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

Chesterfield Elementary School is a 119,500 square foot facility comprised of various space types within one building. The school has three floors and includes classrooms, a gymnasium, offices for the district and the school board, cafetorium, a commercial kitchen, specialty classrooms (art, music and computer labs), a library and other spaces.

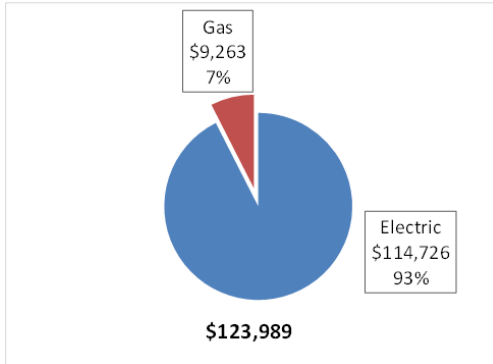
Lighting at Chesterfield Elementary School primarily consists of fluorescent fixtures mounted in suspended ceilings (troffers) as well as wall mounted accent lighting and recessed cans with compact fluorescent lamps. A ground source heat pump system provides much of the heating and air conditioning in the building. There are a number of roof top units with gas fired burners serving the larger spaces and a few small systems serving specialized areas, i.e. server closets. A large energy recovery unit provides ventilation.

## I.2 Your Cost Reduction Opportunities

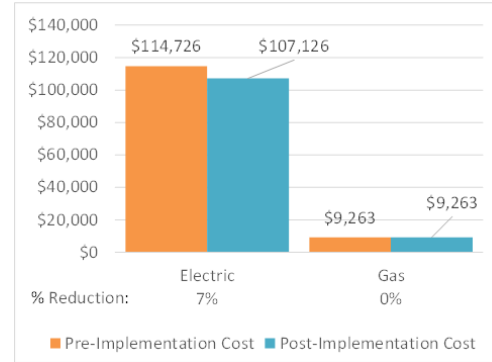
### Energy Conservation Measures

TRC evaluated five measures which together represent an opportunity for Chesterfield Elementary School to reduce annual energy costs by roughly \$12,315.23 and annual greenhouse gas emissions by 1116,513 lbs. CO<sub>2</sub>e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 5.9 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 Chesterfield Elementary School's annual energy use by 9%.

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



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



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

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

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>			<b>107,643</b>	<b>33.0</b>	<b>0.0</b>	<b>\$11,457.23</b>	<b>\$87,882.98</b>	<b>\$18,655.00</b>	<b>\$69,227.98</b>	<b>6.0</b>	<b>108,395</b>
ECM 1	Install LED Fixtures	Yes	15,970	3.7	0.0	\$1,699.84	\$23,248.87	\$4,320.00	\$18,928.87	11.1	16,082
ECM 2	Retrofit Fixtures with LED Lamps	Yes	91,672	29.3	0.0	\$9,757.38	\$64,634.11	\$14,335.00	\$50,299.11	5.2	92,313
<b>Lighting Control Measures</b>			<b>6,107</b>	<b>0.7</b>	<b>0.0</b>	<b>\$649.99</b>	<b>\$2,750.00</b>	<b>\$175.00</b>	<b>\$2,575.00</b>	<b>4.0</b>	<b>6,149</b>
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	1,305	0.3	0.0	\$138.95	\$1,350.00	\$175.00	\$1,175.00	8.5	1,315
ECM 4	Install High/Low Lighting Controls	Yes	4,801	0.3	0.0	\$511.04	\$1,400.00	\$0.00	\$1,400.00	2.7	4,835
<b>Plug Load Equipment Control - Vending Machine</b>			<b>1,954</b>	<b>0.0</b>	<b>0.0</b>	<b>\$208.02</b>	<b>\$460.00</b>	<b>\$0.00</b>	<b>\$460.00</b>	<b>2.2</b>	<b>1,968</b>
ECM 5	Vending Machine Control	Yes	1,954	0.0	0.0	\$208.02	\$460.00	\$0.00	\$460.00	2.2	1,968
<b>TOTALS FOR HIGH PRIORITY MEASURES</b>			<b>115,704</b>	<b>33.7</b>	<b>0.0</b>	<b>\$12,315.23</b>	<b>\$91,092.98</b>	<b>\$18,830.00</b>	<b>\$72,262.98</b>	<b>5.9</b>	<b>116,513</b>
<b>TOTALS FOR ALL EVALUATED MEASURES</b>			<b>115,704</b>	<b>33.7</b>	<b>0.0</b>	<b>\$12,315.23</b>	<b>\$91,092.98</b>	<b>\$18,830.00</b>	<b>\$72,262.98</b>	<b>5.9</b>	<b>116,513</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.

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



## Energy Efficient Practices

TRC also identified nine 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 Chesterfield Elementary School include:

- Perform Regular Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Perform Routine Motor Maintenance
- Practice Use of Thermostat Schedules and Temperature Resets
- Clean Evaporator/Condenser Coils on AC Systems
- Perform Regular Furnace 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 Chesterfield Elementary 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*

<b>Potential</b>	High	
<b>System Potential</b>	200	kW DC STC
<b>Electric Generation</b>	238,274	kWh/yr
<b>Displaced Cost</b>	\$20,730	/yr
<b>Installed Cost</b>	\$520,000	

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

### I.3 Implementation Planning

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

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

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

- SmartStart
- 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.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.3 for additional information on the ESIP Program.

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

## 2 FACILITY INFORMATION AND EXISTING CONDITIONS

### 2.1 Project Contacts

*Figure 5 – Project Contacts*

Name	Role	E-Mail	Phone #
<b>Customer</b>			
Scott Heino	Superintendent	ppisano@chesterfieldschool.com	609 298 6900
Robert Carter	Supervisor of Buildings and Grounds	rcarter@chesterfieldschool.com	609 298 6900 x 1208
<b>TRC Energy Services</b>			
Robert Grindrod	Auditor	rgrindrod@trcsolutions.com	518 416 7202

### 2.2 General Site Information

On July 10, 2018, TRC performed an energy audit at Chesterfield Elementary School located in Chesterfield, New Jersey. TRC’s team met with Mr. Robert Carter to review the facility operations and help focus our investigation on specific energy-using systems.

Chesterfield Elementary School is a 119,500 square foot facility comprised of various space types within one building. The school has three floors and includes classrooms, a gymnasium, offices for the district and the school board, cafetorium, a commercial kitchen, specialty classrooms (art, music and computer labs), a library and other spaces.

The building was constructed in 2011. The building was constructed with T8 fluorescent fixtures with electronic ballasts which was the popular and cost-effective efficient lighting technology available at the time. The school is interested in upgrading to light emitting diode (LED) technology and to that end has already installed LED panel lights in one class room to try them out.

### 2.3 Building Occupancy

The school is open Monday through Friday. The typical schedule is presented in the table below. Extra programs are run through the summer. During a typical day, the facility is occupied by approximately 105 staff and 765 students.

*Figure 6 - Building Schedule*

Building Name	Weekday/Weekend	Operating Schedule
Chesterfield Elementary	Weekday	8 AM - 11 PM
Chesterfield Elementary	Weekend	unoccupied

## 2.4 Building Envelope

This is a steel and concrete block structure with both pitched and flat roofs. The front of the building is one story and built on a ridge and the rear part is three stories with the second story on the same level as the front of the building and the lower level one grade below the ridge. The walls are finished with brick with a 1-inch layer of foam insulation within the wall assembly according to as-build plans reviewed during the audit. The windows are double glazed and likely have a low e coating on the inside surface of the outside pane based on field examination. Both the sloped and flat roofs have 2-inch foam. The flat roof is covered with a white membrane material and asphalt shingles cover the sloped roofs. The entry doors at the main entrance at the bottom of the stairwells in the classroom wing, door to the central courtyard and at the ends of the corridors are all commercial grade metal doors with full height, glazing. Doors to storage, utility or maintenance spaces are unglazed, metal doors.



*Figure 7 – West Facade*



*Figure 8 – South Facade*

## 2.5 On-Site Generation

Chesterfield Elementary School installed approximately 170 solar panels that produced 52,894 kwh October 2016 and October 2017.

## 2.6 Energy-Using Systems

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

## **Lighting System**

Lighting at the facility is provided mostly by linear 32-Watt linear fluorescent T8 lamps with electronic ballasts as well as some compact fluorescent lamps (CFL). Most of the fixtures are 2, 3, or 4-foot long troffers with diffusers. These fixtures were original to the building.

Fifty-two foot square fluorescent troffers serve the cafetorium. Twenty-four 250-Watt metal halide high intensity discharge fixtures serve the gymnasium.

Lighting control in most spaces is provided by occupancy sensors. The occupancy sensors are either wall or ceiling mounted depending on the space layout. Five out of six corridor fixtures are controlled with ceiling mounted occupancy sensors; the remaining fixtures are on 24 hours per day. Stairwells, elevator lobbies and main lobby areas do not contain any occupancy sensors and are on 24 hours per day throughout the year.

The building's exterior lighting includes CFL or high-pressure sodium wall-packs, recessed CFL fixtures in the marquis overhangs, accent lighting in the main entry portico and pole mounted parking metal halide lot fixture. There are accent fixtures mounted in the masonry bollards near the front of the building, but these are not in service. The exterior lighting systems are controlled with timers.



*Figure 9 – Typical Fixtures*



*Figure 10 – Cafetorium Fixtures*



*Figure 11 – Gym HID Fixtures*

## **Ground Source Heat Pump Air Conditioning and Heating System (GSHP)**

The building was designed and constructed with a ground source heat pump system that serves the classrooms and most of the rest of the building. There is a well field under the basketball courts with 200 wells and 111 water source heat pumps in the building ranging in size from ½ ton to 5 tons. Larger spaces like the cafeteria and gymnasium area served by gas fired packaged roof top units. Two 100 HP pumps controlled with variable speed drives circulate the heat transfer fluid through both the well loops and the building circuit. The pumps operate in a lead/lag fashion. The system is controlled with a Carrier i-Vu® Building Automation System.



**Figure 12 – GSHP Circulation Pumps**



**Figure 13 – Water Source HP (in attic over classroom wing)**



**Figure 14 – Pump Variable Speed Drives**

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

An Aaon16 ton packaged roof top unit (RTU) serves the gymnasium and an Aaon 25 ton RTU serves the cafeteria. These units are controlled via the Carrier i-Vu® Building Automation System

There are a number of ductless mini-splits serving isolated areas of the building such as the IT closets and other places where there was a need for more cooling capacity. Electric unit heaters condition spaces near entry doors, the students rest rooms and certain spaces not served by the GSHP system. These units have individual thermostats.



*Figure 15 – Gym RTU*



*Figure 16 – Ductless Mini-Split*

## Ventilation System

Four large energy recovery ventilation (ERV) systems with integrated water source heat pumps extract exhaust air from and supply fresh air to the building and in the process, conserve energy by transferring energy from the exhaust air stream to the incoming fresh air stream. The heat pumps then temper the incoming fresh air. One unit is on the roof and three units are in the attic space above the three-story classroom wing of the building. The roof top ERV has two Florida Heat Pump EC300 25-ton pumps and the remaining ERVs in the attic each have a Florida Heat Pump EC360 30-ton heat pump. The larger ERV has a 10HP supply air fan motor and a 7.5 HP return air fan motor. The smaller units have 7.5 HP supply air fan motors and a 5.0 HP return air fan motors. These units are controlled via the Carrier i-Vu® Building Automation System.

There are also small exhaust ventilators serving restrooms and a kitchen exhaust hood.



*Figure 17 – ERV on Roof*



*Figure 18 – ERV in Attic*

## Domestic Hot Water Heating System

The domestic hot water heating system for the facility consists of one A.O. Smith, 85% efficient domestic hot water boiler with a 750 Gallon side arm tank serving the entire building and an A.O. Smith 100-gallon, 95% efficient heater serving the kitchen.



*Figure 19 – A.O. Smith Boiler*



*Figure 20 – Kitchen DHW heater*



## **Refrigeration**

The facility has two different cold storage areas: a walk-in cooler area and a walk-in freezer area. The cooler area is maintained at a constant temperature of 35°F and freezer area is maintained at a constant -5°F.

There are several small (3-5 cubic foot) refrigerators throughout the building as well as full sized refrigerator/freezers that are not a part of the kitchen operation.

## **Building Plug Load**

There are roughly 127 computer work stations with LCD monitors throughout the facility. There is no centralized PC power management software installed.

There are roughly three server closets scattered throughout the facility with cooling provided by dedicated split systems.

The facility has one refrigerated beverage vending machine.

## **2.7 Water-Using Systems**

There are 10 student restrooms, seven staff bathrooms and eight restrooms in classrooms. A sampling of restrooms found that all of the faucets are rated for 2.0 gallons per minute (gpm) or higher, the toilets are rated at 1.6 gallons per flush (gpf) and the urinals are rated at 1 gpf. There is one restroom off the gym office with a 2 gpm shower.

### 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

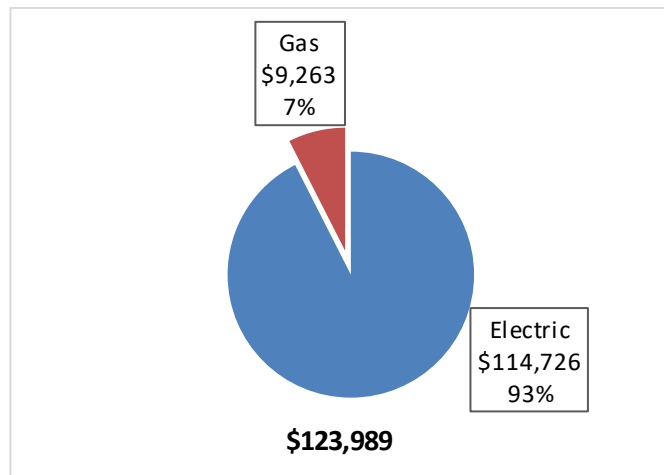
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

*Figure 21 - Utility Summary*

Utility Summary for Chesterfield Township		
Fuel	Usage	Cost
Electricity	1,129,483 kWh	\$114,726
Natural Gas	9,168 Therms	\$9,263
<b>Total</b>		<b>\$123,989</b>

The current annual energy cost for this facility is \$123,989 as shown in the chart below.

*Figure 22 - Energy Cost Breakdown*



### 3.2 Electricity Usage

Electricity is provided by PSE&G. The average electric cost over the past 12 months was \$0.106/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 23 - Electric Usage & Demand

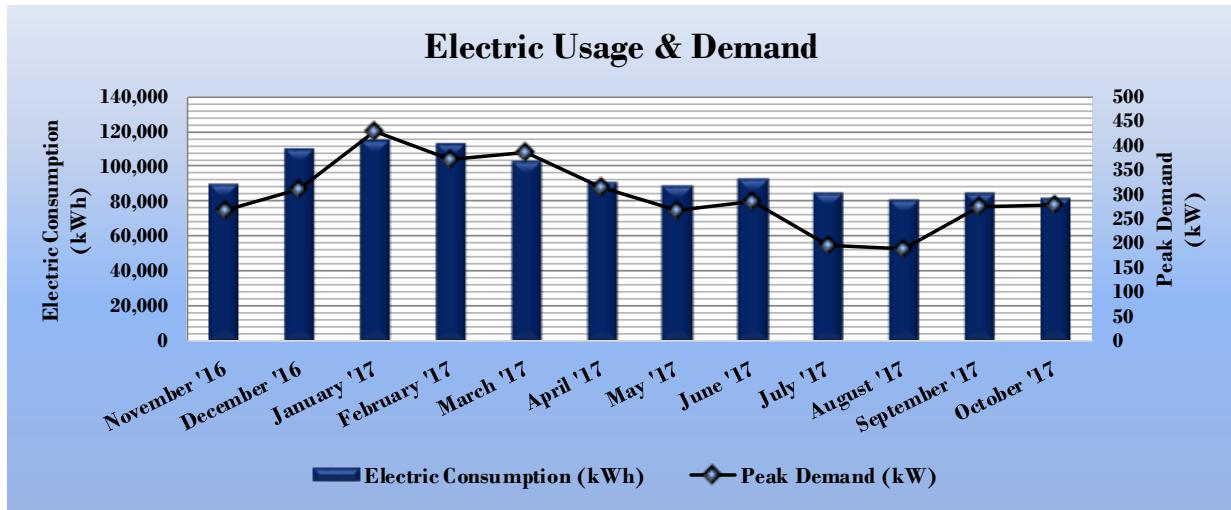


Figure 24 - Electric Usage & Demand

Electric Billing Data for Chesterfield Township					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
11/21/16	31	89,706	267	\$997	\$8,475
12/22/16	31	109,696	311	\$1,282	\$10,757
1/24/17	33	115,522	430	\$1,599	\$11,746
2/23/17	30	113,527	370	\$1,376	\$11,066
3/24/17	29	102,507	385	\$1,446	\$10,088
4/25/17	32	91,183	313	\$1,179	\$8,680
5/24/17	29	88,519	267	\$1,006	\$8,118
6/23/17	30	92,674	286	\$1,078	\$10,711
7/25/17	32	84,485	196	\$736	\$9,049
8/23/17	29	80,400	187	\$704	\$8,456
9/22/17	30	85,204	274	\$1,045	\$10,400
10/23/17	31	82,249	279	\$1,071	\$7,809
<b>Totals</b>	<b>367</b>	<b>1,135,672</b>	<b>429.8</b>	<b>\$13,519</b>	<b>\$115,355</b>
<b>Annual</b>	<b>365</b>	<b>1,129,483</b>	<b>429.8</b>	<b>\$13,445</b>	<b>\$114,726</b>

### 3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is \$1.010/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 25 - Natural Gas Usage

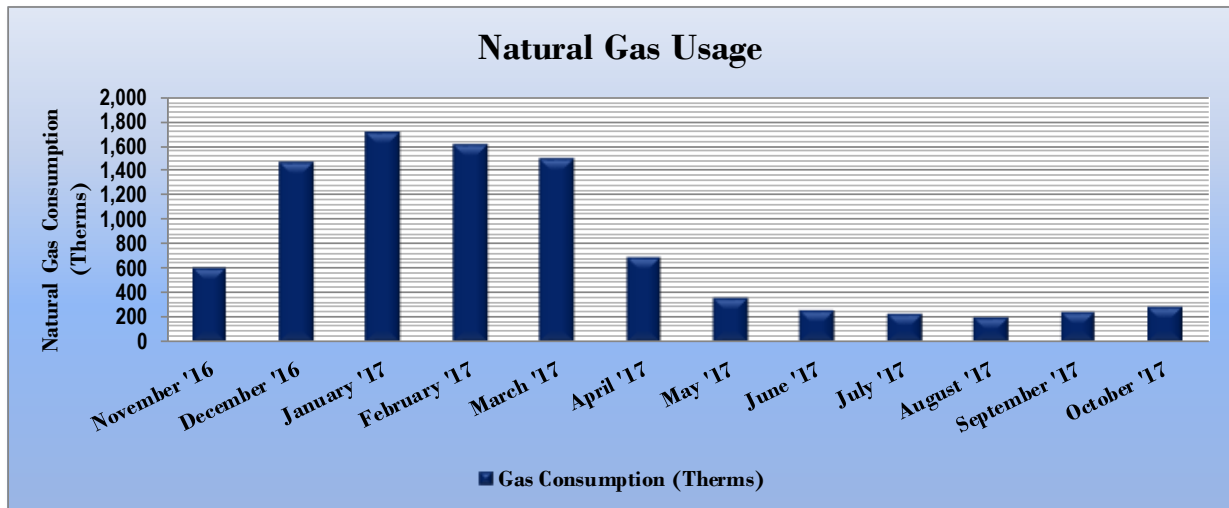


Figure 26 - Natural Gas Usage

Gas Billing Data for Chesterfield Township			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
11/21/16	31	607	\$811
12/22/16	31	1,475	\$1,488
1/24/17	33	1,721	\$1,754
2/23/17	30	1,615	\$1,593
3/24/17	29	1,496	\$1,377
4/25/17	32	690	\$568
5/24/17	29	366	\$352
6/23/17	30	270	\$287
7/25/17	32	232	\$262
8/23/17	29	204	\$244
9/22/17	30	247	\$273
10/23/17	31	297	\$305
<b>Totals</b>	<b>367</b>	<b>9,218</b>	<b>\$9,314</b>
<b>Annual</b>	<b>365</b>	<b>9,168</b>	<b>\$9,263</b>

### 3.4 Benchmarking

This facility was benchmarked using Portfolio Manager<sup>®</sup>, an online tool created and managed by the United States Environmental Protection Agency (EPA) through the ENERGY STAR<sup>®</sup> program. Portfolio Manager<sup>®</sup> 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<sup>®</sup> 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 27 - Energy Use Intensity Comparison – Existing Conditions**

Energy Use Intensity Comparison - Existing Conditions		
	Chesterfield Township	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft <sup>2</sup> )	109.3	141.4
Site Energy Use Intensity (kBtu/ft <sup>2</sup> )	39.9	58.2

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

**Figure 28 - Energy Use Intensity Comparison – Following Installation of Recommended Measures**

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Chesterfield Township	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft <sup>2</sup> )	98.9	141.4
Site Energy Use Intensity (kBtu/ft <sup>2</sup> )	36.6	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR<sup>®</sup> score. This score is a percentile ranking from 1 to 100. It compares your building’s energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR<sup>®</sup> certification. This facility has a current score of 76.

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

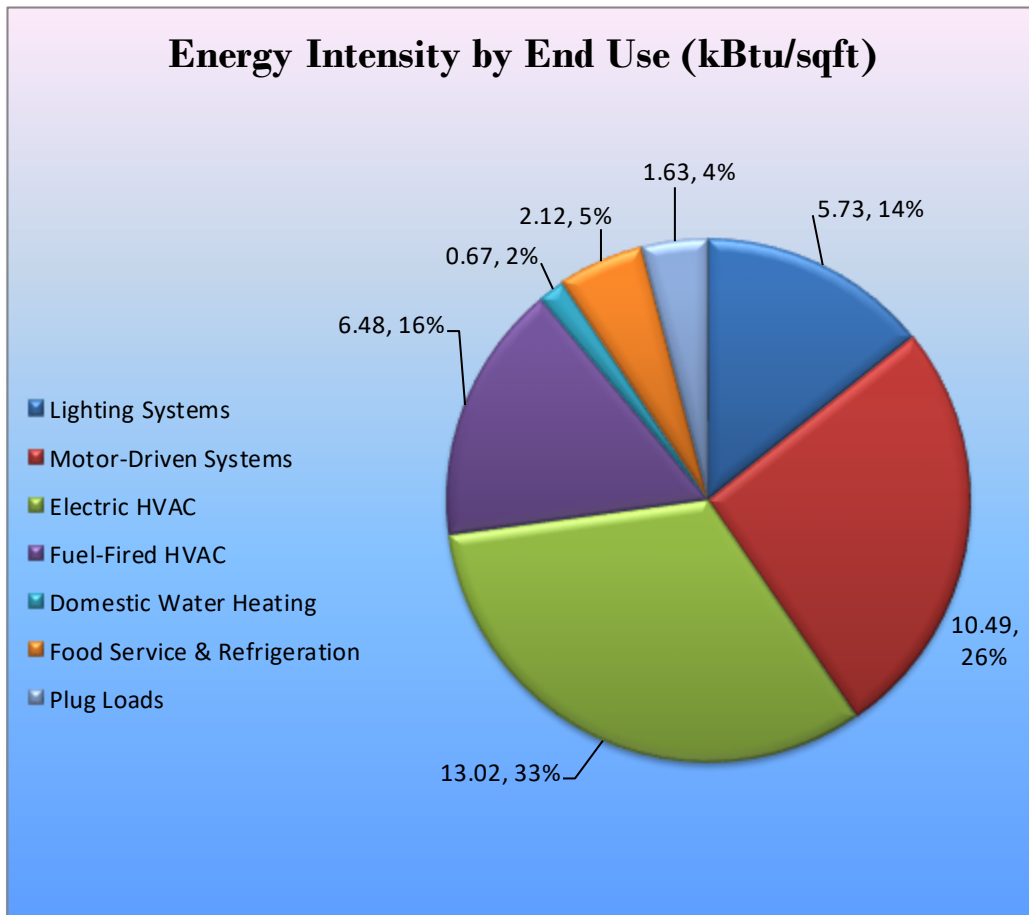
For more information on ENERGY STAR<sup>®</sup> certification go to: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1>.

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 29 - Energy Balance (% and kBtu/SF)



## 4 ENERGY CONSERVATION MEASURES

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

The following sections describe the evaluated measures.

### 4.1 Recommended ECMs

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

*Figure 30 – Summary of Recommended ECMs*

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>107,643</b>	<b>33.0</b>	<b>0.0</b>	<b>\$11,457.23</b>	<b>\$87,882.98</b>	<b>\$18,655.00</b>	<b>\$69,227.98</b>	<b>6.0</b>	<b>108,395</b>
ECM 1	Install LED Fixtures	15,970	3.7	0.0	\$1,699.84	\$23,248.87	\$4,320.00	\$18,928.87	11.1	16,082
ECM 2	Retrofit Fixtures with LED Lamps	91,672	29.3	0.0	\$9,757.38	\$64,634.11	\$14,335.00	\$50,299.11	5.2	92,313
<b>Lighting Control Measures</b>		<b>6,107</b>	<b>0.7</b>	<b>0.0</b>	<b>\$649.99</b>	<b>\$2,750.00</b>	<b>\$175.00</b>	<b>\$2,575.00</b>	<b>4.0</b>	<b>6,149</b>
ECM 3	Install Occupancy Sensor Lighting Controls	1,305	0.3	0.0	\$138.95	\$1,350.00	\$175.00	\$1,175.00	8.5	1,315
ECM 4	Install High/Low Lighting Controls	4,801	0.3	0.0	\$511.04	\$1,400.00	\$0.00	\$1,400.00	2.7	4,835
<b>Plug Load Equipment Control - Vending Machine</b>		<b>1,954</b>	<b>0.0</b>	<b>0.0</b>	<b>\$208.02</b>	<b>\$460.00</b>	<b>\$0.00</b>	<b>\$460.00</b>	<b>2.2</b>	<b>1,968</b>
ECM 5	Vending Machine Control	1,954	0.0	0.0	\$208.02	\$460.00	\$0.00	\$460.00	2.2	1,968
<b>TOTALS</b>		<b>115,704</b>	<b>33.7</b>	<b>0.0</b>	<b>\$12,315.23</b>	<b>\$91,092.98</b>	<b>\$18,830.00</b>	<b>\$72,262.98</b>	<b>5.9</b>	<b>116,513</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 31 below.

*Figure 31 – 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>107,643</b>	<b>33.0</b>	<b>0.0</b>	<b>\$11,457.23</b>	<b>\$87,882.98</b>	<b>\$18,655.00</b>	<b>\$69,227.98</b>	<b>6.0</b>	<b>108,395</b>
ECM 1	Install LED Fixtures	15,970	3.7	0.0	\$1,699.84	\$23,248.87	\$4,320.00	\$18,928.87	11.1	16,082
ECM 2	Retrofit Fixtures with LED Lamps	91,672	29.3	0.0	\$9,757.38	\$64,634.11	\$14,335.00	\$50,299.11	5.2	92,313

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	8,921	2.8	0.0	\$949.51	\$18,597.17	\$3,600.00	\$14,997.17	15.8	8,983
Exterior	7,050	0.9	0.0	\$750.33	\$4,651.70	\$720.00	\$3,931.70	5.2	7,099

#### *Measure Description*

We recommend replacing existing fixtures containing HID lamps in the gymnasium and the HID wall-pack with new high-performance LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes longer than other lighting technologies and have the advantage of coming to full luminosity almost instantaneously.

## ECM 2: Retrofit Fixtures with LED Lamps

### Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
Interior	89,105	28.9	0.0	\$9,484.08	\$63,655.76	\$14,335.00	\$49,320.76	5.2	89,728
Exterior	2,568	0.4	0.0	\$273.31	\$978.35	\$0.00	\$978.35	3.6	2,586

### Measure Description

We recommend retrofitting existing with LED lamps. This measure includes most of the fixtures with linear or “U-” tube lamps including classrooms, offices, corridors, restrooms, and specialty rooms. 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 fluorescent tubes.

## 4.1.2 Lighting Control Measures

Our recommendations for lighting control measures are summarized in Figure 32 below.

**Figure 32 – 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>6,107</b>	<b>0.7</b>	<b>0.0</b>	<b>\$649.99</b>	<b>\$2,750.00</b>	<b>\$175.00</b>	<b>\$2,575.00</b>	<b>4.0</b>	<b>6,149</b>
ECM 3	Install Occupancy Sensor Lighting Controls	1,305	0.3	0.0	\$138.95	\$1,350.00	\$175.00	\$1,175.00	8.5	1,315
ECM 4	Install High/Low Lighting Controls	4,801	0.3	0.0	\$511.04	\$1,400.00	\$0.00	\$1,400.00	2.7	4,835

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

### **ECM 3: Install Occupancy Sensor Lighting Controls**

#### *Summary of Measure Economics*

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
1,305	0.3	0.0	\$138.95	\$1,350.00	\$175.00	\$1,175.00	8.5	1,315

#### *Measure Description*

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

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

## **ECM 4: Install High/Low Lighting Controls**

### *Summary of Measure Economics*

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO <sub>2</sub> e Emissions Reduction (lbs)
4,801	0.3	0.0	\$511.04	\$1,400.00	\$0.00	\$1,400.00	2.7	4,835

### *Measure Description*

We recommend installing occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons. Typical areas for such lighting control are stairwells, interior corridors, parking lots, and parking garages. In the Chesterfield Elementary School, this control technology would be applied to the one out of six fixtures that have no control and are on 24 hours per day, seven days per week.

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 plug load equipment control measures are summarized in Figure 33 below.

**Figure 33 - Summary of Plug Load Equipment 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>Plug Load Equipment Control - Vending Machine</b>		1,954	0.0	0.0	\$208.02	\$460.00	\$0.00	\$460.00	2.2	1,968
ECM 5	Vending Machine Control	1,954	0.0	0.0	\$208.02	\$460.00	\$0.00	\$460.00	2.2	1,968

### ECM 5: 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)
1,954	0.0	0.0	\$208.02	\$460.00	\$0.00	\$460.00	2.2	1,968

#### Measure Description

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

## 5 ENERGY EFFICIENT PRACTICES

---

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.

### **Perform Regular 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.

### **Perform Routine Motor Maintenance**

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

## **Practice Use of Thermostat Schedules and Temperature Resets**

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

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

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

## **Perform Regular Furnace Maintenance**

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

## **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 gpm for bathroom faucets, 2.0 gpm for showerheads, and 1.28 gpm for pre-rinse spray valves.

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

## 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.



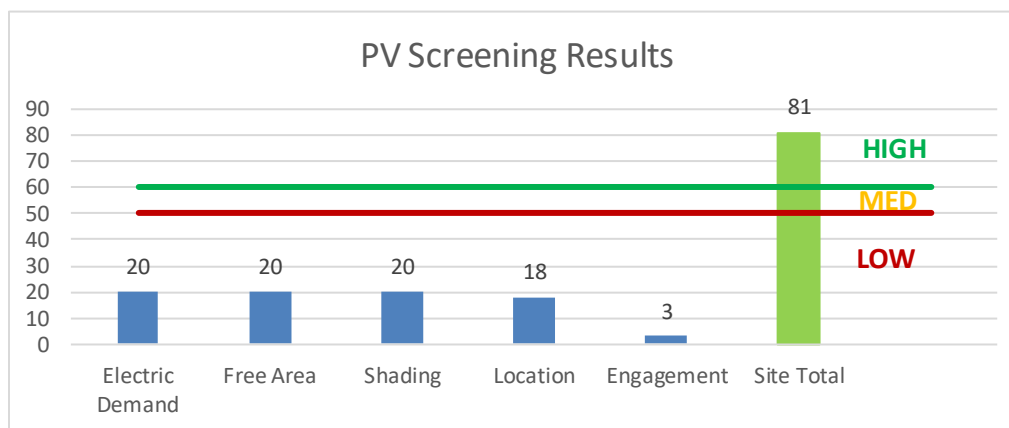
## 6.1 Photovoltaic

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.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the high potential for PV at the site. Additional PV arrays located on the sloped roof areas of the main building may be feasible. If Chesterfield Elementary School is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

**Figure 34 - Photovoltaic Screening**



<b>Potential</b>	High	
<b>System Potential</b>	200	kW DC STC
<b>Electric Generation</b>	238,274	kWh/yr
<b>Displaced Cost</b>	\$20,730	/yr
<b>Installed Cost</b>	\$520,000	

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 8.2 for additional information.

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

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

## 6.2 Combined Heat and Power

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

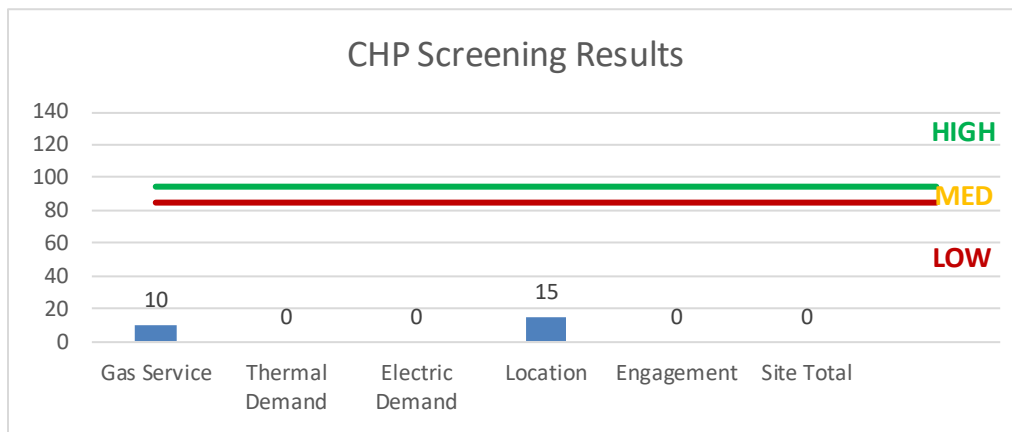
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

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

In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

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

**Figure 35 - 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 ([www.pjm.com/markets-and-operations/demand-response/csps.aspx](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. This site is not a good candidate for demand reduction based on demand profile and low summer occupancy.

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

*Figure 36 - ECM Incentive Program Eligibility*

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

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

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

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

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

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

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

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

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

### 8.3 Energy Savings Improvement Program

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

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

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

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

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

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

## 9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

---

### 9.1 Retail Electric Supply Options

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

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

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

A list of third-party electric suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: [www.state.nj.us/bpu/commercial/shopping.html](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
uplights	6	Compact Fluorescent: (1) 32W Lamp	Daylight Dimming	32	4,015	Relamp	No	6	LED Screw-In Lamps: 18W LED PL	Daylight Dimming	22	4,015	0.03	231	0.0	\$24.62	\$103.35	\$0.00	4.20
A201 Main Office	5	Compact Fluorescent: 26W triple pin based cans 1L	Occupancy Sensor	26	1,260	Relamp	No	5	LED Screw-In Lamps: (1) Pin based LED	Occupancy Sensor	18	1,260	0.03	57	0.0	\$6.01	\$175.00	\$0.00	29.09
Lower level-Hall	11	Compact Fluorescent: 26W triple pin based cans 1L	Occupancy Sensor	26	1,260	Relamp	No	11	LED Screw-In Lamps: (1) Pin based LED	Occupancy Sensor	18	1,260	0.06	124	0.0	\$13.23	\$385.00	\$0.00	29.09
Mid level hall	11	Compact Fluorescent: 26W triple pin based cans 1L	Occupancy Sensor	26	1,260	Relamp	No	11	LED Screw-In Lamps: (1) Pin based LED	Occupancy Sensor	18	1,260	0.06	124	0.0	\$13.23	\$385.00	\$0.00	29.09
Upper Level Hall	11	Compact Fluorescent: 26W triple pin based cans 1L	Occupancy Sensor	26	1,260	Relamp	No	11	LED Screw-In Lamps: (1) Pin based LED	Occupancy Sensor	18	1,260	0.06	124	0.0	\$13.23	\$385.00	\$0.00	29.09
Doorway luminaire wall pack	15	Compact Fluorescent: 26W triple pin based wall mounted downlight - 2L	Daylight Dimming	52	4,015	Relamp	No	15	LED Screw-In Lamps: (1) Pin based LED	Daylight Dimming	18	4,015	0.33	2,355	0.0	\$250.64	\$525.00	\$0.00	2.09
Recessed Soffit CFL	1	Compact Fluorescent: 26W unknown base. 1L	Daylight Dimming	26	900	Relamp	No	1	LED Screw-In Lamps: (1) Pin based LED	Daylight Dimming	18	900	0.01	8	0.0	\$0.86	\$35.00	\$0.00	40.73
Recessed Soffit CFL	8	Compact Fluorescent: 26W unknown base. 1L	Daylight Dimming	26	4,015	Relamp	No	8	LED Screw-In Lamps: (1) Pin based LED	Daylight Dimming	18	4,015	0.04	288	0.0	\$30.67	\$280.00	\$0.00	9.13
Recessed Soffit CFL	1	Compact Fluorescent: 26W unknown base. 1L	Daylight Dimming	26	4,015	Relamp	No	1	LED Screw-In Lamps: (1) Pin based LED	Daylight Dimming	18	4,015	0.01	36	0.0	\$3.83	\$35.00	\$0.00	9.13
Media Center	8	Compact Fluorescent: wall sconce 18 W Long CFL 1L	Occupancy Sensor	26	1,260	Relamp	No	8	LED Screw-In Lamps: (1) Pin based	Occupancy Sensor	18	1,260	0.04	90	0.0	\$9.62	\$193.76	\$0.00	20.13
Atrium	8	Compact Fluorescent: wall sconce 18 W Long CFL 1L	Occupancy Sensor	26	1,260	Relamp	No	8	LED Screw-In Lamps: (1) Pin based	Occupancy Sensor	18	1,260	0.04	90	0.0	\$9.62	\$193.76	\$0.00	20.13
A208 Gym	24	Metal Halide: (1) 250W Lamp	Wall Switch	295	1,800	Fixture Replacement	No	24	LED - Fixtures: High-Bay	Wall Switch	89	1,800	3.25	10,259	0.0	\$1,091.93	\$18,597.17	\$3,600.00	13.73
B250 Kitchen	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	114	1,260	Relamp	No	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,260	0.37	811	0.0	\$86.37	\$730.30	\$200.00	6.14
A248 Kitchen Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	114	1,260	Relamp	No	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,260	0.11	243	0.0	\$25.91	\$219.09	\$60.00	6.14
B250 Kitchen	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	None	114	8,760	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	None	58	8,760	0.15	2,257	0.0	\$240.18	\$292.12	\$80.00	0.88
Wall pack down light	24	Metal Halide: (1) 70W Lamp	Daylight Dimming	95	4,417	Fixture Replacement	No	24	LED - Fixtures: Wall-Wash Lights	Daylight Dimming	29	4,417	1.05	8,107	0.0	\$862.88	\$4,651.70	\$720.00	4.56
B105 RRLL	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.03	72	0.0	\$7.63	\$54.77	\$15.00	5.21
Lower level-Hall	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.65	1,435	0.0	\$152.69	\$1,095.45	\$300.00	5.21
A202 Nurse office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
A202 Nurse exam room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
Media Center	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
A205 Board Office Work Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	18	1,260	0.15	325	0.0	\$34.61	\$105.00	\$45.00	1.73
A201 Main Office Copy Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	18	1,260	0.29	650	0.0	\$69.22	\$210.00	\$90.00	1.73
A208C storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
A210 Computer repair	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.10	215	0.0	\$22.90	\$164.32	\$45.00	5.21

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
A206 Electric	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.03	72	0.0	\$7.63	\$54.77	\$15.00	5.21
Upper level-Hall	28	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	28	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.91	2,008	0.0	\$213.76	\$1,533.63	\$420.00	5.21
Mid level-Hall	28	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	28	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.91	2,008	0.0	\$213.76	\$1,533.63	\$420.00	5.21
Main Level "A" Hall	28	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	28	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.91	2,008	0.0	\$213.76	\$1,533.63	\$420.00	5.21
B310A office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,260	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,260	0.03	72	0.0	\$7.63	\$54.77	\$15.00	5.21
B250 Kit Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,800	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,800	0.03	102	0.0	\$10.91	\$54.77	\$15.00	3.65
B240A Electric	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,800	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,800	0.10	307	0.0	\$32.72	\$164.32	\$45.00	3.65
Upper level-Hall	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	93	8,760	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	6,132	0.49	7,562	0.0	\$804.83	\$1,057.27	\$180.00	1.09
Mid level-Hall	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	93	8,760	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	6,132	0.49	7,562	0.0	\$804.83	\$1,057.27	\$180.00	1.09
Main Level "A" Hall	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	93	8,760	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	6,132	0.25	3,781	0.0	\$402.42	\$528.64	\$90.00	1.09
Lower level-Hall	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	93	8,760	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	6,132	0.49	7,562	0.0	\$804.83	\$1,057.27	\$180.00	1.09
B240 Maintenance office	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	8,760	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	8,760	0.23	3,491	0.0	\$371.53	\$383.41	\$105.00	0.75
A208 Gym	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	500	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	350	0.44	384	0.0	\$40.83	\$854.24	\$195.00	16.14
B101 faculty	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.19	430	0.0	\$45.81	\$328.64	\$90.00	5.21
B102 Resource	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B103 Resource	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B104 Faculty bath	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
B106 Janitor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
B107 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
B108 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B109 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B110 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B111 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B112A	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
B112B	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21

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
B113/4 G,B RR	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
B113/4 G,B RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
B115 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B116 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B117 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B118 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B119 Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.09	191	0.0	\$20.36	\$146.06	\$40.00	5.21
B120 Pump Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.17	383	0.0	\$40.72	\$292.12	\$80.00	5.21
B122 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B123 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
A202 Nurse ward	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.15	335	0.0	\$35.63	\$255.61	\$70.00	5.21
Media Center	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
A204 Art Room	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.41	909	0.0	\$96.70	\$693.79	\$190.00	5.21
A204 Klin room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
A204 Klin room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
A260 Music	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.41	909	0.0	\$96.70	\$693.79	\$190.00	5.21
A260 Music Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
Stair/Lift to stage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
Cafetorium storage	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.11	239	0.0	\$25.45	\$182.58	\$50.00	5.21
A256 G&T	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.26	574	0.0	\$61.07	\$438.18	\$120.00	5.21
A252 Copy room	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.15	335	0.0	\$35.63	\$255.61	\$70.00	5.21
A252 Copy room Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
B250 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
B248 Locker	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
B249 Receiving	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.11	239	0.0	\$25.45	\$182.58	\$50.00	5.21

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
B249 Receiving Electric	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
B249 Custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
B238 EI MR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
B119 Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.09	191	0.0	\$20.36	\$146.06	\$40.00	5.21
B107 Electric	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
A208A,B storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.09	191	0.0	\$20.36	\$146.06	\$40.00	5.21
A210 Computer repair	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
A207 Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
Cafeterium Stage storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
B237 Counselor	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.19	430	0.0	\$45.81	\$328.64	\$90.00	5.21
B241 Janitor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
B236 Resource w/ RR	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.22	478	0.0	\$50.90	\$365.15	\$100.00	5.21
B235 Music	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.32	717	0.0	\$76.34	\$547.73	\$150.00	5.21
B 234 Language	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.32	717	0.0	\$76.34	\$547.73	\$150.00	5.21
B233A	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
B233B	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
B226 Speech	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
B225 offices	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.26	574	0.0	\$61.07	\$438.18	\$120.00	5.21
B224 Speech	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.19	430	0.0	\$45.81	\$328.64	\$90.00	5.21
B216 Electric	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
B217 Sensory	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.19	430	0.0	\$45.81	\$328.64	\$90.00	5.21
B221 class w/ restroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B222 class w/ restroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B223 class w/ restroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B227 class w/ restroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21

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
B228 class w/ restroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B229 class w/ restroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B230 class w/ restroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B242 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B243 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B244 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B245 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B246 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B247 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B311 Electric	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
B310office	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.11	239	0.0	\$26.45	\$182.58	\$50.00	5.21
302 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
303 faculty	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.19	430	0.0	\$45.81	\$328.64	\$90.00	5.21
B304 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B305 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B306 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B307 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B313 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B314 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B315 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B316 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B317 Science Lab	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.32	717	0.0	\$76.34	\$547.73	\$150.00	5.21
B320 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B321 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B322 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21

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
B323 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B326 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B327 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B328 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B329 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B331 Classroom	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.30	669	0.0	\$71.25	\$511.21	\$140.00	5.21
B3-- custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
B325 Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.09	191	0.0	\$20.36	\$146.06	\$40.00	5.21
B325A Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
B325 Conference	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.09	191	0.0	\$20.36	\$146.06	\$40.00	5.21
B333 Resource	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.17	383	0.0	\$40.72	\$292.12	\$80.00	5.21
B332 Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.13	287	0.0	\$30.54	\$219.09	\$60.00	5.21
B332 Electric	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.02	48	0.0	\$5.09	\$36.52	\$10.00	5.21
LL Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
LL Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
ML Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
ML Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
UL Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
UL Boys RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
Main Level A Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
Main Level A Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
Main Level A Girls RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.06	143	0.0	\$15.27	\$109.55	\$30.00	5.21
B215 Server room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.09	191	0.0	\$20.36	\$146.06	\$40.00	5.21
B2xxPump Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.04	96	0.0	\$10.18	\$73.03	\$20.00	5.21
B121 Staff Bath	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65

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
Board Office Rest Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
Stair/Lift to stage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
B249 Receiving	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.09	273	0.0	\$29.08	\$146.06	\$40.00	3.65
Cafetorium Stage	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.26	820	0.0	\$87.25	\$438.18	\$120.00	3.65
LL Faculty RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
LL Faculty RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
Mid Level Faculty RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
Mid Level Faculty RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
Upper Level Faculty RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
Upper Level Faculty RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
Nurse Office RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
Staff RR Kitchen	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
Staff RR Kitchen	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,800	0.02	68	0.0	\$7.27	\$36.52	\$10.00	3.65
NE vestibule	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	1,800	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	None	29	1,800	0.04	137	0.0	\$14.54	\$73.03	\$20.00	3.65
LL Girls RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
LL Boys RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
ML Girls RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
ML Boys RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
UL Girls RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
UL Boys RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
Main Level A Boys RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
Main Level A Boys RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
Main Level A Boys RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
Main Level A Boys RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
B249 Receiving	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75

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
Cafetorium Stage vestibule	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	none	62	8,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	none	29	8,760	0.02	332	0.0	\$35.38	\$36.52	\$10.00	0.75
Media Center	23	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	23	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.44	966	0.0	\$102.87	\$1,666.58	\$0.00	16.20
A205 Board Office reception	20	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	20	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.38	840	0.0	\$89.45	\$1,449.20	\$0.00	16.20
A205 Board OfficeConf	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.11	252	0.0	\$26.84	\$434.76	\$0.00	16.20
A205 Board Office Superintendent	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.11	252	0.0	\$26.84	\$434.76	\$0.00	16.20
A205 Board OfficeBusiness Admin	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.11	252	0.0	\$26.84	\$434.76	\$0.00	16.20
A205 Board Office Payroll	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.11	252	0.0	\$26.84	\$434.76	\$0.00	16.20
A201 Main Office	20	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	20	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.38	840	0.0	\$89.45	\$1,449.20	\$0.00	16.20
A201 Main Office Conf	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.11	252	0.0	\$26.84	\$434.76	\$0.00	16.20
A201 Main Office Principle	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.11	252	0.0	\$26.84	\$434.76	\$0.00	16.20
Atrium	22	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	22	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.42	924	0.0	\$98.40	\$1,594.12	\$0.00	16.20
A256 G&T	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.02	42	0.0	\$4.47	\$72.46	\$0.00	16.20
B312 Security	5	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	5	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.10	210	0.0	\$22.36	\$362.30	\$0.00	16.20
B242 Classroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.02	42	0.0	\$4.47	\$72.46	\$0.00	16.20
B243 Classroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.02	42	0.0	\$4.47	\$72.46	\$0.00	16.20
B244 Classroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.02	42	0.0	\$4.47	\$72.46	\$0.00	16.20
B245 Classroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.02	42	0.0	\$4.47	\$72.46	\$0.00	16.20
B246 Classroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.02	42	0.0	\$4.47	\$72.46	\$0.00	16.20
B247 Classroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	62	1,260	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,260	0.02	42	0.0	\$4.47	\$72.46	\$0.00	16.20
Media Center	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	None	62	8,760	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	6,132	0.15	2,351	0.0	\$250.26	\$704.76	\$35.00	2.68
Cafetorium	50	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	1,800	Relamp	Yes	50	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	27	1,260	1.13	3,566	0.0	\$379.51	\$3,248.63	\$855.00	6.31
Media Center	20	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	32	1,260	Relamp	No	20	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,260	0.23	507	0.0	\$53.98	\$365.15	\$100.00	4.91
Atrium	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	32	1,260	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,260	0.05	101	0.0	\$10.80	\$73.03	\$20.00	4.91
A257 Computer Lab	25	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	32	1,260	Relamp	No	25	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,260	0.29	634	0.0	\$67.47	\$456.44	\$125.00	4.91
A209 Computer Lab	25	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	32	1,260	Relamp	No	25	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,260	0.29	634	0.0	\$67.47	\$456.44	\$125.00	4.91



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
Elevator cab	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	none	32	1,800	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	none	15	1,800	0.02	72	0.0	\$7.71	\$36.52	\$10.00	3.44
uplights	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Daylight Dimming	32	4,025	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Daylight Dimming	15	4,025	0.01	81	0.0	\$8.62	\$18.26	\$5.00	1.54
301 Classroom	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	None	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,260	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Exit signs	52	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	52	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
B120	Entire Building	2	Other	100.0	94.5%	Yes	1,372	No	94.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main level pump room	Entire Building	1	Other	5.0	85.5%	Yes	0	No	85.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main level pump room	DHW circulation system	1	Process Pump	0.5	77.0%	No	2,745	No	77.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kiln room A209 Art	Kiln room A209 Art	1	Exhaust Fan	0.1	77.0%	No	40	No	77.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Exhaust fans	4	Exhaust Fan	0.1	77.0%	No	0	No	77.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Exhaust fans	1	Exhaust Fan	0.3	77.0%	No	0	No	77.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Exhaust fans	6	Exhaust Fan	0.3	77.0%	No	0	No	77.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Exhaust fans	2	Exhaust Fan	0.3	77.0%	No	0	No	77.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Exhaust fans	2	Exhaust Fan	0.3	77.0%	No	0	No	77.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Gym	1	Supply Fan	7.5	90.2%	Yes	0	No	90.2%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Cafeteria	1	Supply Fan	10.0	90.7%	Yes	3,086	No	90.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Attic	B Wing ERVs	3	Supply Fan	7.5	90.2%	Yes	3,086	No	90.2%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Attic	B Wing ERVs	3	Exhaust Fan	5.0	89.5%	Yes	2,498	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Attic	B Wing ERVs	3	Other	0.3	77.0%	No	2,498	No	77.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	A Wing ERV	1	Supply Fan	10.0	90.7%	Yes	3,086	No	90.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	A Wing ERV	1	Exhaust Fan	7.5	90.2%	Yes	3,086	No	90.2%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	A Wing ERV	1	Other	0.3	77.0%	No	2,498	No	77.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
PSH006	Various	3	Supply Fan	0.1	92.0%	Yes	2,498	No	92.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
PSH009	Various	15	Supply Fan	0.1	92.0%	Yes	2,498	No	92.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
PSH012	Various	15	Supply Fan	0.1	92.0%	Yes	2,498	No	92.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
PSH018	Various	11	Supply Fan	0.3	92.0%	Yes	2,498	No	92.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
PSH030	Various	12	Supply Fan	0.5	92.0%	Yes	2,498	No	92.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
PSH036	Various	28	Supply Fan	0.8	92.0%	Yes	2,498	No	92.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
PSH042	Various	20	Supply Fan	0.8	92.0%	Yes	2,498	No	92.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
PSH048	Various	5	Supply Fan	0.8	92.0%	Yes	2,498	No	92.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
PSH060	Various	2	Supply Fan	1.0	92.0%	Yes	2,498	No	92.0%	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
Hall Ceiling	Occupied Space	3	Water Source HP	0.50	7.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hall Ceiling	Occupied Space	15	Water Source HP	0.75	9.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hall Ceiling	Occupied Space	15	Water Source HP	1.00	13.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hall Ceiling	Occupied Space	11	Water Source HP	1.50	17.70	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hall Ceiling	Occupied Space	12	Water Source HP	2.50	28.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hall Ceiling	Occupied Space	28	Water Source HP	3.00	34.40	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hall Ceiling	Occupied Space	20	Water Source HP	3.50	35.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hall Ceiling	Occupied Space	5	Water Source HP	4.00	40.50	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hall Ceiling	Occupied Space	2	Water Source HP	5.00	56.70	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
GSHP Pump room	GSHP Pump room	3	Electric Resistance Heat		17.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Electric Unit Heaters	Lower B level Stairwells	4	Electric Resistance Heat		11.26	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Electric Unit Heaters	Main Level entry vestibules	3	Electric Resistance Heat		15.70	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof top unit 1	Gym	1	Packaged AC	16.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Electric Unit Heaters	Girls/Boys Rest Rooms	10	Electric Resistance Heat		5.10	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
various	Server room	6	Ductless Mini-Split AC	0.75		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
various	Server room	1	Ductless Mini-Split AC	2.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
various	Security	1	Ductless Mini-Split AC	2.55		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
various	Security	2	Ductless Mini-Split AC	2.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof top unit 2	Cafeteria	1	Packaged AC	25.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	West Main Floor ERV	2	Water Source HP	25.00	375.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis							
Location	Area(s)/System(s) Served	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
Attic	Classroom Wing	3	Water Source HP	30.00	375.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Fuel Heating Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
		System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Gym	1	Furnace	230.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Cafeteria	1	Furnace	360.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### DHW Inventory & Recommendations

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

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

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

### Commercial Refrigerator/Freezer Inventory & Recommendations

Location	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	3	Stand-Up Refrigerator, Solid Door (>50 cu. ft.)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Various	3	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Various	2	Stand-Up Refrigerator, Solid Door (≤15 cu. ft.)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Commercial Ice Maker Inventory & Recommendations

Location	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
	Quantity	Ice Maker Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Ice Making Head (≥450 lbs/day), Continuous	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Novelty Cooler Inventory & Recommendations

Location	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis							
	Quantity	Cooler Description	Install Automatic Shutoff 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	Milk Cooler	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	Insulated Food Holding Cabinet (Full Size)	Yes	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Electric Combination Oven/Steam Cooker (15 - 28 Pans)	Yes	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Electric Steamer	Yes	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Gas Convection Oven (Full Size)	Yes	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Electric Convection Oven (Full Size)	Yes	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	Electric	Yes	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

### Plug Load Inventory

Location	Existing Conditions			ENERGY STAR Qualified?
	Quantity	Equipment Description	Energy Rate (W)	
Mobil Carts	144	Chrome books	40.0	
A level teacher's lounge	1	Coffee maker	900.0	
A201 Office	1	Coffee maker	900.0	
A225	1	Coffee maker	900.0	
B325b	1	Coffee maker	900.0	
Upper Level B Teacher Lounge	1	Coffeemaker	900.0	
A205 Board	1	Coffemaker	900.0	
A201 Office	8	Desktop PCs	110.0	
A204 Art	2	Desktop PCs	110.0	
A205 Board	6	Desktop PCs	110.0	
A209 Computer Lab	1	Desktop PCs	110.0	
B215 server room	8	Desktop PCs	110.0	
B301, Resource	4	Desktop PCs	110.0	
B317 Science	1	Desktop PCs	110.0	
B325	1	Desktop PCs	110.0	
Upper Level B Classrooms	68	Desktop PCs	110.0	
Media Center	12	HP all in one	50.0	
A204 Art	1	Kiln	14,340.0	
A201 Office	2	Laptop	35.0	
A205 Board	1	Laptop	35.0	
B310	1	Laptop	35.0	
B325	1	Laptop	35.0	
B325a	1	Laptop	35.0	
Upper Level B Classrooms	17	Laptop	35.0	
A level teacher's lounge	1	Large copier	850.0	
A201 Office	1	Large Copier	850.0	
A205 Board	1	Large copier	850.0	
B325	1	Large copier	850.0	
Media Center	1	Large copier	850.0	
A201 Office	3	Large Monitor	150.0	
A205 Board	1	Large Monitor	150.0	
A201 Office	8	LCD Monitors	40.0	
A204 Art	2	LCD Monitors	40.0	
A205 Board	10	LCD Monitors	40.0	
A209 Computer Lab	2	LCD Monitors	40.0	




Existing Conditions				
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
B301, Resource	4	LCD Monitors	40.0	
B317 Science	1	LCD Monitors	40.0	
B325	1	LCD Monitors	40.0	
Upper Level B Classrooms	68	LCD Monitors	40.0	
A205 Board	1	Microwav e	75.0	
A225	1	Microwav e	75.0	
B325b	1	Microwav e	75.0	
Media Center	1	Microwav e	75.0	
Upper Level B Teacher Lounge	1	Microwav e	75.0	
A209 Computer Lab	27	MiniPCs	65.0	
B215 server room	2	Modems	25.0	
B317 Science	1	Plant light rack	200.0	
A204 Art	1	Projector	300.0	
A205 Board	1	Projector	300.0	
A209 Computer Lab	1	Projector	300.0	
B301, Resource	1	Projector	300.0	
B317 Science	1	Projector	300.0	
B325b	1	Projector	300.0	
Upper Level B Classrooms	17	Projector	300.0	
B215 server room	5	Servers	200.0	
A201 Office	2	Small Printer	13.0	
A204 Art	1	Small Printer	13.0	
A205 Board	7	Small Printer	13.0	
A209 Computer Lab	1	Small Printer	13.0	
A225	1	Small Printer	13.0	
B310	1	Small Printer	13.0	
B325	1	Small Printer	13.0	
Media Center	1	Small Printer	13.0	
Upper Level B Classrooms	17	Small Printer	13.0	
B301, Resource	1	Smart board	150.0	
B317 Science	1	Smart board	150.0	
Upper Level B Classrooms	17	Smart board	150.0	
A204 Art	1	Smart Board	150.0	
A209 Computer Lab	1	Smart Board	150.0	
B215 server room	4	Switch PSU	200.0	

Existing Conditions				
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
B215 server room	2	Switch PSU	200.0	
Mid level B classrooms	17	Smart Board	150.0	
Mid level B classrooms	17	Projector	150.0	

### 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
Teacher's Lounge B101	1	Refrigerated	Yes	0.00	1,612	0.0	\$171.56	\$230.00	\$0.00	1.34
Teacher's Lounge B101	1	Non-Refrigerated	Yes	0.00	343	0.0	\$36.46	\$230.00	\$0.00	6.31

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



LEARN MORE AT [energystar.gov](http://energystar.gov)

# ENERGY STAR® Statement of Energy Performance

## 76

### Chesterfield Elementary School

**ENERGY STAR® Score<sup>1</sup>**

Primary Property Type: K-12 School  
 Gross Floor Area (ft<sup>2</sup>): 119,500  
 Built: 2011

For Year Ending: September 30, 2017  
 Date Generated: October 12, 2018

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

#### Property & Contact Information

Property Address	Property Owner	Primary Contact
Chesterfield Elementary School 30 Saddle Way Chesterfield, New Jersey 08515	Chesterfield Elementary School 30 Saddle Way Chesterfield, NJ 08515 (609) 298-6900	Scott Helno 30 Saddle Way Chesterfield, NJ 08515 (609) 298-6900 shelno@chesterfieldschool.com

Property ID: 6572670

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

Site EUI	Annual Energy by Fuel	National Median Comparison
38.9 kBtu/ft <sup>2</sup>	Natural Gas (kBtu) 922,406 (20%) Electric - Solar (kBtu) 177,753 (4%) Electric - Grid (kBtu) 3,548,151 (76%)	National Median Site EUI (kBtu/ft <sup>2</sup> ) 51.7 National Median Source EUI (kBtu/ft <sup>2</sup> ) 123.3 % Diff from National Median Source EUI -25%
Source EUI		Annual Emissions
92.7 kBtu/ft <sup>2</sup>		Greenhouse Gas Emissions (Metric Tons CO <sub>2</sub> e/year) 408

#### 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)