Local Government Energy Audit:
Energy Audit Report

Drum Point Elementary School

Brick Township Board of Education

41 Drum Point Road
Brick, NJ 08723

April 16, 2018

Final Report by:
TRC Energy Services

Disclaimer

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

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

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

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

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1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Drum Point 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 school districts in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

Drum Point Elementary School is a one-story building totaling 52,720 square feet and was constructed in 1961. The building has a flat roof and exterior walls are finished with brick masonry. Interior lighting consists primarily of a combination of T8 and T12 linear lamps and fixtures which are mostly controlled with manual wall switches. Heating is provided by three con-condensing gas fired boilers. The cooling system consists of split system air conditioners.

A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 10 measures including nine high priority measures which together represent an opportunity for Drum Point Elementary School to reduce annual energy costs by $19,688.62 and annual greenhouse gas emissions by 193,498 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 6 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce Drum Point Elementary School's annual energy use by 18.6%.

Figure 1 – Previous 12 Month Utility Costs

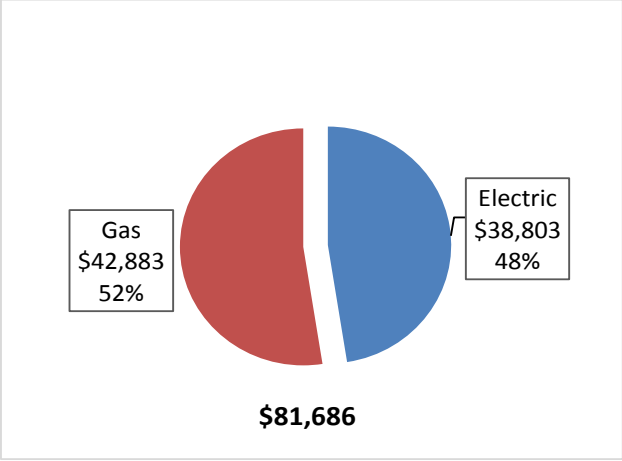
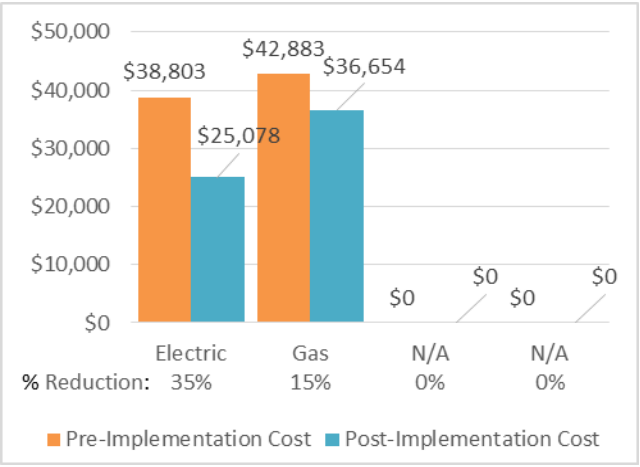


Figure 2 – Potential Post-Implementation Costs



A detailed description of Drum Point 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_2e Emissions Reduction (lbs)
Lighting Upgrades			**90,468**	**21.2**	**0.0**	**$10,692.32**	**$61,941.23**	**$8,140.00**	**$53,801.23**	**5.0**	**91,101**
ECM 1	Install LED Fixtures	Yes	7,074	3.0	0.0	$836.05	$7,707.36	$1,515.00	$6,192.36	7.4	7,123
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	37,671	8.1	0.0	$4,452.25	$27,390.17	$2,040.00	$25,350.17	5.7	37,934
ECM 3	Retrofit Fixtures with LED Lamps	Yes	45,724	10.0	0.0	$5,404.02	$26,843.71	$4,585.00	$22,258.71	4.1	46,043
Lighting Control Measures			**12,666**	**2.7**	**0.0**	**$1,497.04**	**$8,494.00**	**$1,170.00**	**$7,324.00**	**4.9**	**12,755**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	11,267	2.4	0.0	$1,331.58	$7,914.00	$1,170.00	$6,744.00	5.1	11,345
ECM 5	Install High/Low Lighitng Controls	Yes	1,400	0.3	0.0	$165.45	$580.00	$0.00	$580.00	3.5	1,410
Motor Upgrades			**2,243**	**0.6**	**0.0**	**$265.04**	**$5,521.02**	**$0.00**	**$5,521.02**	**20.8**	**2,258**
	Premium Efficiency Motors	No	2,243	0.6	0.0	$265.04	$5,521.02	$0.00	$5,521.02	20.8	2,258
Variable Frequency Drive (VFD) Measures			**7,878**	**1.0**	**0.0**	**$931.09**	**$8,368.96**	**$0.00**	**$8,368.96**	**9.0**	**7,933**
ECM 6	Install VFDs on Hot Water Pumps	Yes	7,878	1.0	0.0	$931.09	$8,368.96	$0.00	$8,368.96	9.0	7,933
Electric Unitary HVAC Measures			**2,871**	**1.7**	**0.0**	**$339.32**	**$3,266.28**	**$0.00**	**$3,266.28**	**9.6**	**2,891**
ECM 7	Install High Efficiency Electric AC	Yes	2,871	1.7	0.0	$339.32	$3,266.28	$0.00	$3,266.28	9.6	2,891
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**656.3**	**$6,072.78**	**$106,383.23**	**$12,254.00**	**$94,129.23**	**15.5**	**76,843**
ECM 8	Install High Efficiency Hot Water Boilers	Yes	0	0.0	656.3	$6,072.78	$106,383.23	$12,254.00	$94,129.23	15.5	76,843
Domestic Water Heating Upgrade			**0**	**0.0**	**16.9**	**$156.09**	**$107.55**	**$0.00**	**$107.55**	**0.7**	**1,975**
ECM 9	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	16.9	$156.09	$107.55	$0.00	$107.55	0.7	1,975
TOTALS FOR PROPOSED MEASURES			**113,884**	**26.6**	**626.4**	**$19,688.62**	**$188,561.25**	**$21,564.00**	**$166,997.25**	**6.0**	**193,498**
TOTALS FOR ALL MEASURES			**116,126**	**27.2**	**673.2**	**$19,953.66**	**$194,082.27**	**$21,564.00**	**$172,518.27**	**8.6**	**195,756**

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

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

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

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

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

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

Electric Unitary HVAC measures generally involve replacing older inefficient air conditioning systems with modern energy efficient systems. New air conditioning systems can provide equivalent cooling to older

air condition systems at a reduced energy cost. These measures save energy by reducing the power used by the air conditioning systems, due to improved electrical efficiency.

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

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

Energy Efficient Best Practices

TRC also identified 14 low cost (or no cost) energy efficient best 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 best practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. It is our understanding Brick Township Board of Education is already implementing many of the best practices described in the audit reports, however they are listed for representative purposes only.

- Close Doors and Windows
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Perform Routine Motor Maintenance
- Use Fans to Reduce Cooling Load
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Install Plug Load Controls
- Water Conservation

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

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation for Drum Point Elementary School. Although Brick Township Board of Education implemented a solar energy project in 2017 and already evaluated each school building, TRC still performed an analysis to determine the potential for installing solar at these sites as part of the LGEA program's scope of audit services. Based on the configuration of the site and its loads there is a high potential for installing a photovoltaic (PV) array.

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

1.3 Implementation Planning

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

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

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

- SmartStart
- Direct Install
- Energy Savings Improvement Program (ESIP)

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

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

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 8.4 for additional information on the ESIP Program.

Additional information on relevant incentive programs is located in Section 8 or: www.njcleanenergy.com/ci.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 4 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
James W. Edwards, Jr.	Business Administrator/Board Secretary	jedwards@brickschools.org	732 785-3000
Designated Representative			
Gary Miller	Head Custodian		(609) 891-9100
TRC Energy Services			
Moussa Traore	Auditor	mtraore@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On February 15, 2017, TRC performed an energy audit at Drum Point Elementary School located in Brick, New Jersey. TRC's auditor met with Gary Miller to review the facility operations and help focus our investigation on specific energy-using systems.

The 52,720 square foot school building is a one-story facility comprised of classrooms, administrative offices, nurse room, art room, cafeteria, gymnasium, kitchen, faculty rooms, and mechanical spaces. The original building was built in 1961 and a new section was added in 1976.The building is used primarily for elementary programs.

2.3 Building Occupancy

The school operates on a 10 month schedule and is open Monday through Friday. The typical schedule is presented in the table below. During a typical day, the school is occupied by approximately 481 students and 75 staff.

Figure 5 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Drum Point Elementary School	Weekday	6:30 AM - 5:30 PM
Drum Point Elementary School	Weekend	Closed

2.4 Building Envelope

The one-story building has a reinforced concrete foundation and a flat roof which was not accessible during the side visit, but the site contact indicated that the roof is in good condition. There are no rooftop HVAC units excepting exhaust fans. Exterior walls are finished with brick masonry. The windows throughout the facility are double paned, with tinted glass and aluminum frames. They are in good condition and appear to be well maintained. Exterior doors are constructed of metal and are likewise in good condition. Overall, the building's envelope is in acceptable condition with some signs of roof leakage.

2.5 On-Site Generation

Drum Point Elementary School does not have any on-site electric generation capacity.

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 by a combination of fixtures with 32-Watt linear fluorescent T8 and 40-Watt T12 lamps with both electronic and magnetic ballasts. There are also some incandescent lamps. Most of the linear fluorescent fixtures are 4-foot long with one, two or four lamps. The gymnasium is lit with 6-lamp, 4-foot long fluorescent fixtures with 32-Watt T8 lamps. Interior lighting control is provided mainly by manual wall switches. Exit signs are primarily LED. The building exterior lighting consists of a combination of incandescent and metal halide lamps. Exterior lights are controlled with photocells.

Hot Water Heating System

The hot water system consists of three non-condensing hot water boilers all located in the boiler room. Two of the three boilers are HB Smith Series 44 boilers with an output capacity of 1800 MBh and an estimated combustion efficiency of 75%. The two boilers appeared to be original to the building and serve the old section of the building. They have passed their useful service life as defined by ASHRAE. The third boiler is a Weil McLAIN 1970 MBh boiler. The boiler has an estimated capacity of 75% and serves the 1976 addition. It appeared to be original to the 1976 section and has also passed its useful service life. The two HB Smith boilers are served by three 1.5 hp base mounted, end suction pumps located in the boiler room and run with constant speed. The 1976 section is also served by two 1.5 hp in-line pumps that run at constant speed. The pumps distribute heating

hot water generated by the boilers, and provide heating to the zones via unit ventilators. Thermostats are located in the classrooms for individual control of the perimeter heating and ventilation units.

Direct Expansion Air Conditioning System (DX)

The cooling system consists of 12 split system air conditioners, one window unit, and one mini-split heat pump. The split systems are mainly two ton units and are two years old. They are in good condition. The three tons Carrier window unit serving the library appeared to be in poor condition as it has passed its useful service life. Air is exhausted from the facility through the roof mounted exhaust fans.

Domestic Hot Water Heating System

The domestic hot water heating system for the facility consists of two water heaters. One is an A.O. Smith gas fired non-condensing water heater with an input rating of 75 MBh, an estimated efficiency of 75%, and a storage capacity of 75 gallons. This water heater is 25 years old and appeared in acceptable condition. The other water heater is a Vanguard electric with an input rating of 4.5 kW and a tank storage capacity of 47 gallons. It is 11 years old.

Food Service & Refrigeration

The school also houses a small non-commercial kitchen. The kitchen includes gas cooking ovens and three stand-up refrigerators. The kitchen is well maintained.

Building Plug Load

There are approximately 55 computer work stations throughout the facility and they are mostly desktop units with LCD monitors. There is no centralized PC power management software installed. There is one server closest in the facility that has cooling provided by a 2 tons split system air conditioner unit. There are no vending machines in the facility.

2.7 Water-Using Systems

There are several restrooms at this facility. A sampling of restrooms found that all of the faucets are rated for 2 gallons per minute (gpm) or higher, the toilets are rated at 2.5 gallons per flush (gpf) and the urinals are rated at 2 gpf. There are no restrooms with showers.

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

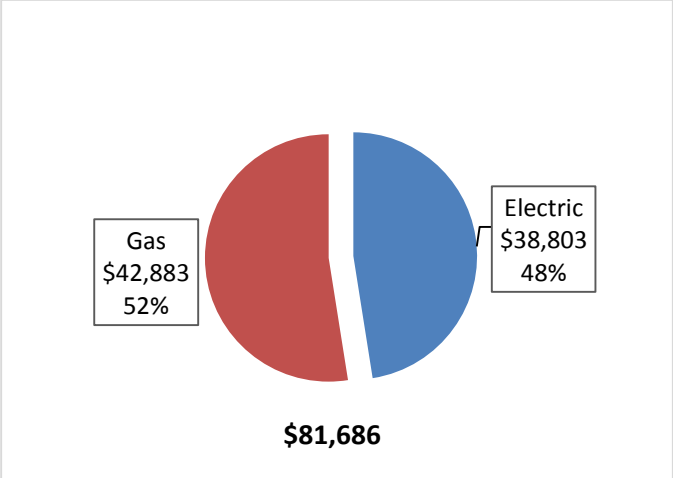
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 6 - Utility Summary

Utility Summary for Drum Point Elementary School		
Fuel	**Usage**	**Cost**
Electricity	328,313 kWh	$38,803
Natural Gas	46,344 Therms	$42,883
Total		**$81,686**

The current annual energy cost for this facility is $81,686 as shown in the chart below.

Figure 7 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by JCP&L. The average electric cost over the past 12 months was $0.118/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 electricity profile indicates a moderate reduction of summer use consistent with a reduced use of the site during summer months, followed by increased usage during warmer months when school is back in session. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 8 - Electric Usage & Demand

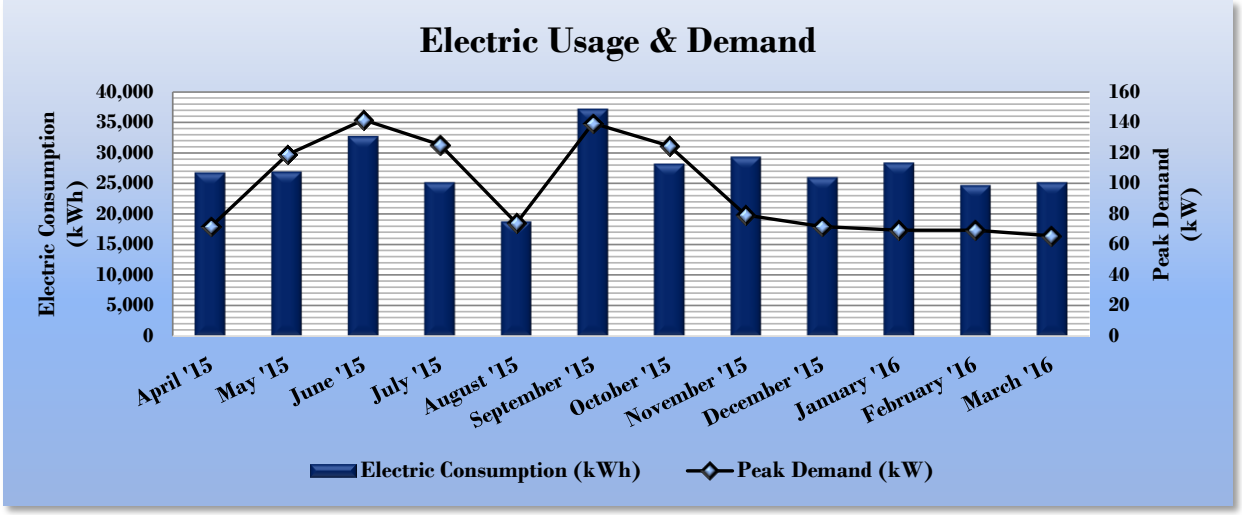


Figure 9 - Electric Usage & Demand

Electric Billing Data for Drum Point Elementary School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
4/16/15	31	26,786	72	$107	$3,034
5/16/15	28	26,926	119	$109	$3,335
6/16/15	32	32,686	142	$133	$4,076
7/16/15	31	25,166	125	$176	$2,925
8/16/15	29	18,766	74	$76	$2,308
9/16/15	33	37,166	140	$151	$4,502
10/16/15	29	28,206	125	$115	$3,489
11/16/15	32	29,326	79	$119	$3,253
12/16/15	28	25,966	72	$106	$2,989
1/16/16	35	28,366	69	$115	$3,224
2/16/16	29	24,686	69	$100	$2,864
3/16/16	29	25,166	66	$153	$2,911
Totals	**366**	**329,212**	**141.6**	**$1,462**	**$38,909**
Annual	**365**	**328,313**	**141.6**	**$1,458**	**$38,803**

3.3 Natural Gas Usage

Natural Gas is provided by NJ Natural Gas. The average gas cost for the past 12 months is $0.925/therm, which is the blended rate used throughout the analyses in this report. Natural gas use follows a typical heating profile. The monthly gas consumption is shown in the chart below.

Figure 10 - Natural Gas Usage

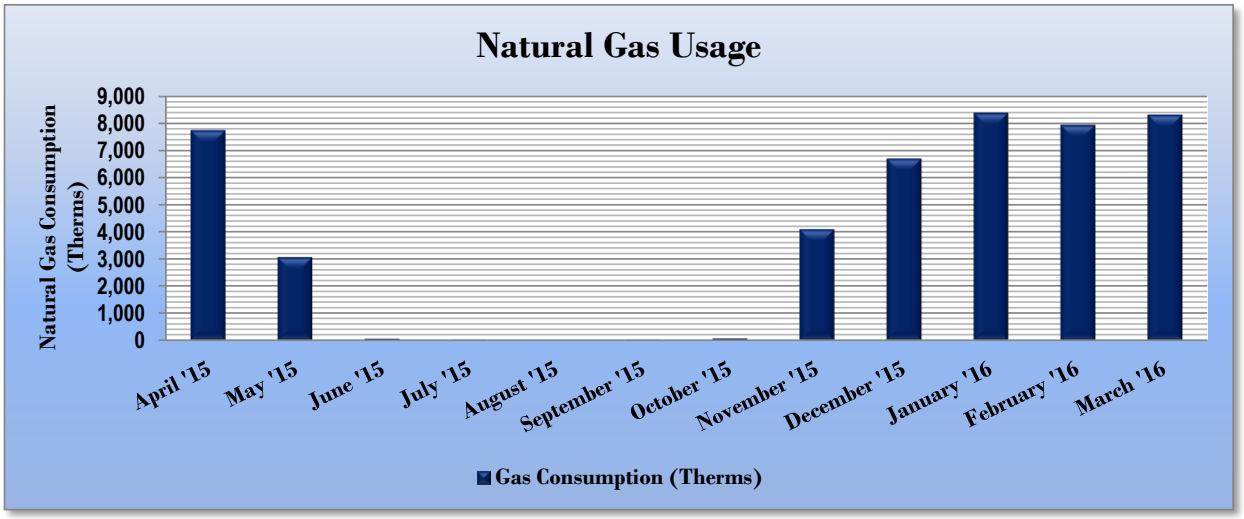


Figure 11 - Natural Gas Usage

Gas Billing Data for Drum Point Elementary School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
4/15/15	30	7,734	$6,870
5/15/15	30	3,065	$3,004
6/14/15	31	55	$511
7/15/15	32	14	$478
8/14/15	31	9	$474
9/14/15	30	21	$483
10/14/15	30	64	$517
11/11/15	29	4,085	$3,686
12/15/15	30	6,690	$5,902
1/15/16	31	8,378	$7,157
2/13/16	31	7,932	$6,707
3/15/16	30	8,299	$7,093
Totals	**365**	**46,344**	**$42,883**
Annual	**365**	**46,344**	**$42,883**

3.4 Benchmarking

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

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

Figure 12 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Drum Point Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	159.0	141.4
Site Energy Use Intensity (kBtu/ft^2)	109.2	58.2

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

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

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Drum Point Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	122.5	141.4
Site Energy Use Intensity (kBtu/ft^2)	89.0	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 16.

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

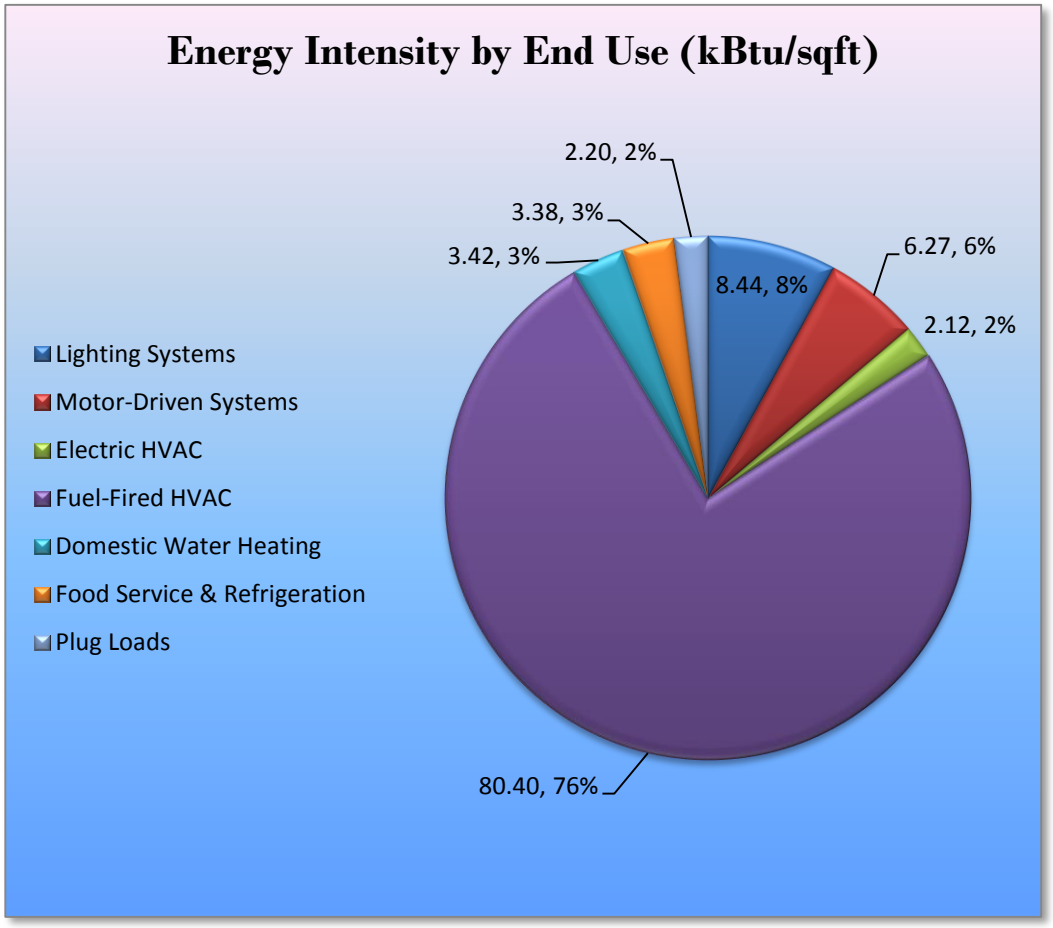
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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

3.5 Energy End-Use Breakdown

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

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



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Drum Point 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 Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 8.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 15 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**90,468**	**21.2**	**0.0**	**$10,692.32**	**$61,941.23**	**$8,140.00**	**$53,801.23**	**5.0**	**91,101**
ECM 1	Install LED Fixtures	7,074	3.0	0.0	$836.05	$7,707.36	$1,515.00	$6,192.36	7.4	7,123
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	37,671	8.1	0.0	$4,452.25	$27,390.17	$2,040.00	$25,350.17	5.7	37,934
ECM 3	Retrofit Fixtures with LED Lamps	45,724	10.0	0.0	$5,404.02	$26,843.71	$4,585.00	$22,258.71	4.1	46,043
Lighting Control Measures		**12,666**	**2.7**	**0.0**	**$1,497.04**	**$8,494.00**	**$1,170.00**	**$7,324.00**	**4.9**	**12,755**
ECM 4	Install Occupancy Sensor Lighting Controls	11,267	2.4	0.0	$1,331.58	$7,914.00	$1,170.00	$6,744.00	5.1	11,345
ECM 5	Install High/Low Lighitng Controls	1,400	0.3	0.0	$165.45	$580.00	$0.00	$580.00	3.5	1,410
Variable Frequency Drive (VFD) Measures		**7,878**	**1.0**	**0.0**	**$931.09**	**$8,368.96**	**$0.00**	**$8,368.96**	**9.0**	**7,933**
ECM 6	Install VFDs on Hot Water Pumps	7,878	1.0	0.0	$931.09	$8,368.96	$0.00	$8,368.96	9.0	7,933
Electric Unitary HVAC Measures		**2,871**	**1.7**	**0.0**	**$339.32**	**$3,266.28**	**$0.00**	**$3,266.28**	**9.6**	**2,891**
ECM 7	Install High Efficiency Electric AC	2,871	1.7	0.0	$339.32	$3,266.28	$0.00	$3,266.28	9.6	2,891
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**656.3**	**$6,072.78**	**$106,383.23**	**$12,254.00**	**$94,129.23**	**15.5**	**76,843**
ECM 8	Install High Efficiency Hot Water Boilers	0	0.0	656.3	$6,072.78	$106,383.23	$12,254.00	$94,129.23	15.5	76,843
Domestic Water Heating Upgrade		**0**	**0.0**	**16.9**	**$156.09**	**$107.55**	**$0.00**	**$107.55**	**0.7**	**1,975**
ECM 9	Install Low-Flow Domestic Hot Water Devices	0	0.0	16.9	$156.09	$107.55	$0.00	$107.55	0.7	1,975
TOTALS		**113,884**	**26.6**	**673.2**	**$19,688.62**	**$188,561.25**	**$21,564.00**	**$166,997.25**	**8.5**	**193,498**

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

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

4.1.1 Lighting Upgrades

Recommended upgrades to existing lighting fixtures are summarized in Figure 16 below.

Figure 16 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**90,468**	**21.2**	**0.0**	**$10,692.32**	**$61,941.23**	**$8,140.00**	**$53,801.23**	**5.0**	**91,101**
ECM 1	Install LED Fixtures	7,074	3.0	0.0	$836.05	$7,707.36	$1,515.00	$6,192.36	7.4	7,123
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	37,671	8.1	0.0	$4,452.25	$27,390.17	$2,040.00	$25,350.17	5.7	37,934
ECM 3	Retrofit Fixtures with LED Lamps	45,724	10.0	0.0	$5,404.02	$26,843.71	$4,585.00	$22,258.71	4.1	46,043

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

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	43	0.0	0.0	$5.02	$63.65	$0.00	$63.65	12.7	43
Exterior	7,031	3.0	0.0	$831.03	$7,643.71	$1,515.00	$6,128.71	7.4	7,081

Measure Description

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

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

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	37,671	8.1	0.0	$4,452.25	$27,390.17	$2,040.00	$25,350.17	5.7	37,934
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend retrofitting existing 40-Watt fluorescent T12 fixtures by removing fluorescent tubes and ballasts and replacing them with LEDs and LED drivers (if necessary), which are designed to be used retrofitted fluorescent fixtures. The measure uses the existing fixture housing but replaces the rest of the components with more efficient lighting technology. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

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

ECM 3: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	45,214	9.8	0.0	$5,343.74	$26,521.19	$4,555.00	$21,966.19	4.1	45,530
Exterior	510	0.2	0.0	$60.28	$322.52	$30.00	$292.52	4.9	514

Measure Description

We recommend retrofitting existing incandescent, compact fluorescent lamps (CFL), and 32-Watt linear fluorescent T8 lamps with LED lamps. Many LED tube lamps are direct replacements for existing fluorescent lamps and can be installed while leaving the fluorescent fixture ballast in place. LED bulbs can be used in existing fixtures as a direct replacement for most other lighting technologies. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

4.1.2 Lighting Control Measures

Figure 17 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**9,484**	**2.0**	**0.0**	**$1,120.87**	**$5,452.00**	**$760.00**	**$4,692.00**	**4.2**	**9,550**
ECM 4	Install Occupancy Sensor Lighting Controls	8,084	1.7	0.0	$955.41	$4,872.00	$760.00	$4,112.00	4.3	8,140
ECM 5	Install High/Low Lighitng Controls	1,400	0.3	0.0	$165.45	$580.00	$0.00	$580.00	3.5	1,410

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 4: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
11,267	2.4	0.0	$1,331.58	$7,914.00	$1,170.00	$6,744.00	5.1	11,345

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in all classrooms, offices areas, library, faculty rooms, and gymnasium. 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 5: 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_2e Emissions Reduction (lbs)
1,400	0.3	0.0	$165.45	$580.00	$0.00	$580.00	3.5	1,410

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 interior corridors.

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

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

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

4.1.3 Variable Frequency Drive Measures

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

Figure 18 – Summary of Variable Frequency Drive ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**7,878**	**1.0**	**0.0**	**$931.09**	**$8,368.96**	**$0.00**	**$8,368.96**	**9.0**	**7,933**
ECM 6	Install VFDs on Hot Water Pumps	7,878	1.0	0.0	$931.09	$8,368.96	$0.00	$8,368.96	9.0	7,933

ECM 6: Install VFDs on Hot Water Pumps

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
7,878	1.0	0.0	$931.09	$8,368.96	$0.00	$8,368.96	9.0	7,933

Measure Description

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

4.1.4 Electric Unitary HVAC Measures

Our recommendations for unitary HVAC measures are summarized in Figure 19 below.

Figure 19 - Summary of Unitary HVAC ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**2,871**	**1.7**	**0.0**	**$339.32**	**$3,266.28**	**$0.00**	**$3,266.28**	**9.6**	**2,891**
ECM 7	Install High Efficiency Electric AC	2,871	1.7	0.0	$339.32	$3,266.28	$0.00	$3,266.28	9.6	2,891

ECM 7: Install High Efficiency Air Conditioning Units

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
2,871	1.7	0.0	$339.32	$3,266.28	$0.00	$3,266.28	9.6	2,891

Measure Description

We recommend replacing standard efficiency window air conditioning unit with high efficiency air conditioning unit. There have been significant improvements in both compressor and fan motor efficiencies over the past several years. Therefore, electricity savings can be achieved by replacing older units with new high efficiency units. A higher EER or SEER rating indicates a more efficient cooling system. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average cooling load, and the estimated annual operating hours.

4.1.5 Gas-Fired Heating System Replacements

Our recommendations for gas-fired heating system replacements are summarized in Figure 20 below.

Figure 20 - Summary of Gas-Fired Heating Replacement ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**656.3**	**$6,072.78**	**$106,383.23**	**$12,254.00**	**$94,129.23**	**15.5**	**76,843**
ECM 8	Install High Efficiency Hot Water Boilers	0	0.0	656.3	$6,072.78	$106,383.23	$12,254.00	$94,129.23	15.5	76,843

ECM 8: Install High Efficiency Hot Water Boilers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	656.3	$6,072.78	$106,383.23	$12,254.00	$94,129.23	15.5	76,843

Measure Description

We recommend replacing older inefficient hot water boilers with high efficiency hot water boilers. Significant improvements have been made in combustion technology resulting in increased overall boiler efficiency. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

The most notable efficiency improvement is condensing hydronic boilers that can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies between 85% and 87% (comparable to other high efficiency boilers) when the return water temperature is above 130°F. The boiler efficiency increases as the return water temperature drops below 130°F. Therefore, condensing hydronic boilers were only evaluated when the return water temperature is less than 130°F during most of the operating hours. As a result condensing hydronic boilers are recommended for this site.

4.1.6 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 21 below.

Figure 21 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**16.9**	**$156.09**	**$107.55**	**$0.00**	**$107.55**	**0.7**	**1,975**
ECM 9	Install Low-Flow Domestic Hot Water Devices	0	0.0	16.9	$156.09	$107.55	$0.00	$107.55	0.7	1,975

ECM 9: Install Low-Flow DHW Devices

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	16.9	$156.09	$107.55	$0.00	$107.55	0.7	1,975

Measure Description

We recommend installing low-flow domestic hot water devices to reduce overall hot water demand. Energy demand from domestic hot water heating systems can be reduced by reducing water usage in general. Faucet aerators can reduce hot water usage, relative to standard aerators, which saves energy. Low-flow devices reduce the overall water flow from the fixture, while still adequate pressure for washing. This reduces the amount of water used per day resulting in energy and water savings.

4.2 ECMs Evaluated But Not Recommended

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

Figure 22 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades	**2,243**	**0.6**	**0.0**	**$265.04**	**$5,521.02**	**$0.00**	**$5,521.02**	**20.8**	**2,258**
Premium Efficiency Motors	2,243	0.6	0.0	$265.04	$5,521.02	$0.00	$5,521.02	20.8	2,258
TOTALS	**2,243**	**0.6**	**0.0**	**$265.04**	**$5,521.02**	**$0.00**	**$5,521.02**	**20.8**	**2,258**

* - 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).

Premium Efficiency Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
2,243	0.6	0.0	$265.04	$5,521.02	$0.00	$5,521.02	20.8	2,258

Measure Description

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

Reasons for not Recommending

The overall simple payback for this project is nearly 21 years which is more than the recommended 13 year threshold.

5 ENERGY EFFICIENT BEST 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. The recommendations below are for informational purposes only and do not reflect actual efforts actively being performed by Brick Township Board of Education

Close Doors and Windows

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

Perform Proper Lighting Maintenance

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

Develop a Lighting Maintenance Schedule

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

Ensure Lighting Controls Are Operating Properly

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

Perform Routine Motor Maintenance

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

Use Fans to Reduce Cooling Load

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

Practice Proper Use of Thermostat Schedules and Temperature Resets

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

Clean Evaporator/Condenser Coils on AC Systems

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

Clean and/or Replace HVAC Filters

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

Perform Proper Boiler Maintenance

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

Perform Proper Water Heater Maintenance

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

Plug Load Controls

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

Water Conservation

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

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

Refer to Section 4.1.6 for any low-flow ECM recommendations.

6 On-Site Generation Measures

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

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

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

6.1 Photovoltaic

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

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

Brick Township Board of Education had on-going installations of solar energy projects at several schools during the time of site visits. According to PV-Watts1 (an online solar calculator of the US Dept. of Energy) the building has sufficient unshaded rooftop space available to accommodate a solar array of up to about 97 kW of solar generating capacity. TRC estimates that installing the 97 kW PV array, would generate about 105,450 kWh per year. Such as array would offset about 52% the facility's annual electric needs. As mentioned in Section 1.2, this evaluation was conducted as part of the LGEA Program's scope of audit services. The analysis is a high-level approach to help identify sites that may have potential for installing PV arrays and does not take into account additional factors that may need to be addressed before installation (e.g. roof's ability to support array, etc.).

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. If Drum Point Elementary School is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted. An image of the available roof space is shown below. The estimated costs and savings for such an installations are shown in the Figure 23 below.

[1] http://pvwatts.nrel.gov/pvwatts.php

Figure 23 – Drum Point Elementary School Rooftop (approximate size of proposed solar PV array)

Estimated costs and benefits for a 97 kW solar array on this site.

Total Installed Cost	**$339,500**	**$**
Value of Electric Generation per Year	**$17,273**	**$**
Annual Income from SRECS	**$24,675**	**$**
Total Economic Value per Year	**$41,948**	**$**
Simple Payback Period	**8.09**	**years**

We estimate that the proposed array would pay for itself in about eight years.

Solar projects must register their projects in the SREC Registration Program prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about developed new solar projects and insight into future SREC pricing. Refer to Section 8.3 for additional information.

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

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

6.2 Combined Heat and Power

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

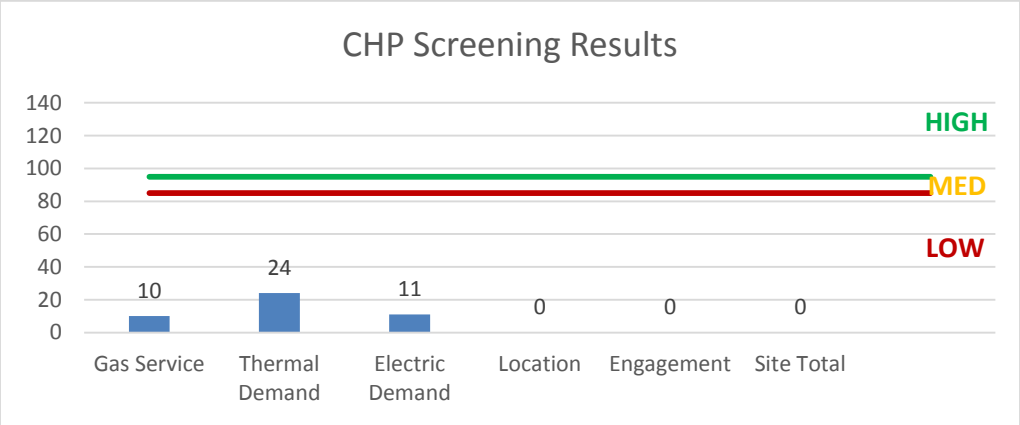
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

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

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

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

Figure 24 - Combined Heat and Power Screening



7 DEMAND RESPONSE

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

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

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

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

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

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

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

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

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 25 for a list of the eligible programs identified for each recommended ECM.

Figure 25 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x		x			
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x		x			
ECM 3	Retrofit Fixtures with LED Lamps	x		x			
ECM 4	Install Occupancy Sensor Lighting Controls	x		x			
ECM 5	Install High/Low Lighitng Controls						
ECM 6	Install VFDs on Hot Water Pumps			x			
ECM 7	Install High Efficiency Electric AC			x			
ECM 8	Install High Efficiency Hot Water Boilers	x		x			
ECM 9	Install Low-Flow Domestic Hot Water Devices			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.

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

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

8.1 SmartStart

Overview

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

Equipment with Prescriptive Incentives Currently Available:

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

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

Incentives

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

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

How to Participate

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

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

8.2 Direct Install

Overview

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

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Direct Install participants will also be held to a fiscal year cap of $250,000 per entity.

How to Participate

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

Since Direct Install offers a free assessment of eligible measures, Direct Install is also available to small businesses and other commercial facilities too that may not be eligible for the more detailed facility audits provided by LGEA.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

8.3 SREC Registration Program

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

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

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

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

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

8.4 Energy Savings Improvement Program

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

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

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

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

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

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

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.06	301	0.0	$35.52	$175.50	$30.00	4.10
Electrical Room	3	Incandescent: 65W A Lamp	Wall Switch	65	2,640	Relamp	No	3	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	9	2,640	0.11	510	0.0	$60.28	$161.26	$15.00	2.43
Custodian Office	1	Incandescent: 65W A Lamp	Wall Switch	65	2,640	Relamp	Yes	1	LED Screw-In Lamps: LED Screw-In Lamps	Occupancy Sensor	9	1,848	0.04	178	0.0	$21.06	$169.75	$5.00	7.82
New Wing Corridor	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	26	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,848	0.71	3,292	0.0	$389.03	$1,753.00	$260.00	3.84
New Wing Corridor	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.48	2,228	0.0	$263.37	$1,067.33	$220.00	3.22
Library	8	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,640	0.62	2,866	0.0	$338.73	$1,294.67	$160.00	3.35
OTPT Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.48	2,228	0.0	$263.37	$1,067.33	$220.00	3.22
OTPT Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,640	Relamp & Reballast	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,640	0.15	716	0.0	$84.68	$323.67	$40.00	3.35
Room 29	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	10	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.11	531	0.0	$62.79	$359.00	$50.00	4.92
Room 29	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	Yes	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	871	0.0	$102.91	$900.00	$60.00	8.16
Room 30	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.48	2,228	0.0	$263.37	$1,067.33	$220.00	3.22
Room 30	8	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,640	0.62	2,866	0.0	$338.73	$1,294.67	$160.00	3.35
Room 25	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.48	2,228	0.0	$263.37	$1,067.33	$220.00	3.22
Room 25	8	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,640	0.62	2,866	0.0	$338.73	$1,294.67	$160.00	3.35
Room 27	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.48	2,228	0.0	$263.37	$1,067.33	$220.00	3.22
Room 27	8	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,640	0.62	2,866	0.0	$338.73	$1,294.67	$160.00	3.35
Room 28	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.48	2,228	0.0	$263.37	$1,067.33	$220.00	3.22
Room 28	8	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,640	0.62	2,866	0.0	$338.73	$1,294.67	$160.00	3.35
Room 34	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.34	1,560	0.0	$184.36	$781.93	$160.00	3.37
Room 34	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,640	Relamp & Reballast	No	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,640	0.23	1,075	0.0	$127.02	$485.50	$60.00	3.35
Room 34	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.05	213	0.0	$25.12	$143.60	$20.00	4.92
Room 26	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.48	2,228	0.0	$263.37	$1,067.33	$220.00	3.22
Room 26	8	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,640	0.62	2,866	0.0	$338.73	$1,294.67	$160.00	3.35
Faculty Room	6	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	653	0.0	$77.18	$704.00	$50.00	8.47

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boys Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.04	200	0.0	$23.68	$117.00	$20.00	4.10
Girls Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	$11.84	$58.50	$10.00	4.10
Women Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.02	97	0.0	$11.48	$96.40	$20.00	6.65
Women Restroom	4	Incandescent: 65W A Lamp	Wall Switch	65	2,640	Relamp	Yes	4	LED Screw-In Lamps: LED Screw-In Lamps	Occupancy Sensor	9	1,848	0.15	713	0.0	$84.25	$331.01	$20.00	3.69
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.08	380	0.0	$44.89	$291.50	$30.00	5.83
Boys Restroom	1	Incandescent: 65W A Lamp	Wall Switch	65	2,640	Relamp	No	1	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	7	2,640	0.04	176	0.0	$20.81	$53.75	$5.00	2.34
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.08	380	0.0	$44.89	$291.50	$30.00	5.83
Girls Restroom	1	Incandescent: 65W A Lamp	Wall Switch	65	2,640	Relamp	No	1	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	9	2,640	0.04	170	0.0	$20.09	$53.75	$5.00	2.43
Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	$11.84	$58.50	$10.00	4.10
Men Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 24	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 24	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Room 22	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 22	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Room 20	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 20	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Room 18	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 18	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Faculty Room	1	Incandescent: 65W A Lamp	Wall Switch	65	2,640	Relamp	No	1	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	9	2,640	0.04	170	0.0	$20.09	$53.75	$5.00	2.43
Room 15	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 15	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Room 16	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 16	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Room 17	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 17	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Room 14	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 14	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Room 19	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 19	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Room 21	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 21	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Art Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Art Room	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Server Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	$11.84	$58.50	$10.00	4.10
Middle Corridor	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,848	0.25	1,139	0.0	$134.67	$642.50	$90.00	4.10
Middle Corridor	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
BSI Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.06	266	0.0	$31.40	$179.50	$25.00	4.92
BSI Room	3	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.06	287	0.0	$33.91	$294.00	$15.00	8.23
Storage	1	Incandescent: 65W A Lamp	Wall Switch	65	2,640	Relamp	No	1	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	9	2,640	0.04	170	0.0	$20.09	$53.75	$5.00	2.43
Nurse Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.05	213	0.0	$25.12	$143.60	$20.00	4.92
Nurse Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.04	191	0.0	$22.61	$196.00	$10.00	8.23
Nurse Office	1	Compact Fluorescent: 23W Screen in CFL	Wall Switch	23	2,640	Fixture Replacement	No	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	9	2,640	0.01	43	0.0	$5.02	$63.65	$0.00	12.67
Main Office	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Main Office	5	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.10	478	0.0	$56.51	$490.00	$25.00	8.23
Principal Office	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.20	929	0.0	$109.76	$618.60	$90.00	4.82
Principal Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.04	200	0.0	$23.68	$117.00	$20.00	4.10
Gymnasium	16	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	176	2,640	Relamp	No	16	LED - Linear Tubes: (6) 4' Lamps	Wall Switch	87	2,640	0.93	4,323	0.0	$510.96	$2,147.57	$480.00	3.26
Gymnasium - Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.08	380	0.0	$44.89	$291.50	$50.00	5.38
Gymnasium - Stage	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.06	266	0.0	$31.40	$179.50	$25.00	4.92

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Gymnasium - Stage	3	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.06	287	0.0	$33.91	$294.00	$15.00	8.23
Front Corridor	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,848	0.49	2,279	0.0	$269.33	$1,285.00	$180.00	4.10
Front Corridor	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
2nd Server Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.02	106	0.0	$12.56	$71.80	$10.00	4.92
Custodian Closet	1	Incandescent: 65W A Lamp	Wall Switch	65	2,640	Relamp	No	1	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	9	2,640	0.04	170	0.0	$20.09	$53.75	$5.00	2.43
Room 12	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 12	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 12	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 10	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 10	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 10	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 8	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	10	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.11	531	0.0	$62.79	$359.00	$50.00	4.92
Room 8	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	Yes	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	871	0.0	$102.91	$900.00	$60.00	8.16
Room 8	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 6	11	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	11	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.16	730	0.0	$86.24	$510.90	$75.00	5.05
Room 6	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 6	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 4	11	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	11	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.16	730	0.0	$86.24	$510.90	$75.00	5.05
Room 4	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 4	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 2	11	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	11	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.16	730	0.0	$86.24	$510.90	$75.00	5.05
Room 2	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 2	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 1	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 1	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 1	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 3	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 3	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 3	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 7	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 7	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 7	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 5	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 5	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 5	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 11	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 11	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 11	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 13	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 13	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 13	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Room 9	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	663	0.0	$78.40	$475.00	$70.00	5.17
Room 9	8	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,640	Relamp & Reballast	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.17	765	0.0	$90.42	$784.00	$40.00	8.23
Room 9	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	$5.74	$48.20	$10.00	6.65
Cafeteria - Corridor	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.14	630	0.0	$74.42	$259.60	$40.00	2.95
Cafeteria - Corridor	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,640	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.08	358	0.0	$42.34	$234.00	$20.00	5.05
Cafeteria - Corridor	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	$11.84	$58.50	$10.00	4.10
Kitchen	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.11	501	0.0	$59.21	$292.50	$50.00	4.10
Kitchen	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,640	Relamp & Reballast	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.12	537	0.0	$63.51	$351.00	$30.00	5.05

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Incandescent: 65W A Lamp	Wall Switch	65	2,640	Relamp	No	2	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	9	2,640	0.07	340	0.0	$40.19	$107.51	$10.00	2.43
Closet	1	Incandescent: 90W A Lamp	Wall Switch	90	2,640	Relamp	No	1	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	9	2,640	0.05	246	0.0	$29.06	$53.75	$5.00	1.68
Exterior Perimeter Light	15	Metal Halide: (1) 250W Lamp	Daylight Dimming	295	1,320	Fixture Replacement	No	15	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	55	1,320	2.36	5,465	0.0	$645.88	$5,860.16	$1,500.00	6.75
Exterior Perimeter Light	6	Incandescent: 65W A Lamp	Daylight Dimming	65	1,320	Relamp	No	6	LED Screw-In Lamps: LED Screw-In Lamps	Daylight Dimming	9	1,320	0.22	510	0.0	$60.28	$322.52	$30.00	4.85
Exterior Perimeter Light	1	Compact Fluorescent: 42W Screen in CFL	Daylight Dimming	42	1,320	Fixture Replacement	No	1	LED - Fixtures: Downlight Solid State Retrofit	Daylight Dimming	9	1,320	0.02	50	0.0	$5.92	$63.65	$0.00	10.75
Parking Lot Light	3	Metal Halide: (1) 400W Lamp	Daylight Dimming	458	1,320	Fixture Replacement	No	3	LED - Fixtures: Outdoor Post-Mount	Daylight Dimming	125	1,320	0.65	1,516	0.0	$179.23	$1,719.90	$15.00	9.51

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	School Building - 1976 Section	2	Heating Hot Water Pump	1.5	77.0%	No	2,745	Yes	86.5%	Yes	1	0.47	3,129	0.0	$369.78	$3,866.07	$0.00	10.46
Boiler Room	School Building - Old Section	2	Heating Hot Water Pump	1.5	77.0%	No	2,745	Yes	86.5%	Yes	1	0.62	4,172	0.0	$493.04	$4,523.94	$0.00	9.18
Boiler Room	School Building - Old Section	1	Heating Hot Water Pump	1.5	77.0%	No	2,745	Yes	86.5%	Yes	1	0.31	2,086	0.0	$246.52	$3,390.61	$0.00	13.75
Boiler Room	Combustion Sytem	1	Combustion Air Fan	0.8	69.0%	No	2,745	Yes	81.1%	No		0.08	282	0.0	$33.36	$413.05	$0.00	12.38
Boiler Room	School Building	2	Exhaust Fan	0.5	65.0%	No	2,745	Yes	78.2%	No		0.12	452	0.0	$53.42	$1,696.31	$0.00	31.75
Boiler Room	Boiler Room	1	Exhaust Fan	0.5	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	School Building	2	Exhaust Fan	0.3	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
School Building	School Building	49	Supply Fan	0.5	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Combustion Sytem	2	Combustion Air Fan	1.5	80.0%	No	2,745	No	80.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooms	Rooms	12	Supply Fan	0.1	78.5%	No	2,745	No	78.5%	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
Library	Library	1	Window AC	3.00		Yes	1	Window AC	3.00		12.00		No	1.70	2,871	0.0	$339.32	$3,266.28	$0.00	9.63
Room 28	Room 28	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Server Rooms	Server Rooms	2	Split-System AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 26	Room 26	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 15	Room 15	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 14	Room 14	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 17	Room 17	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 19	Room 19	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 21	Room 21	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 13	Room 13	1	Split-System AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 1	Room 1	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 5	Room 5	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 9	Room 9	1	Ductless Mini-Split HP	1.50	18.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	New Section	1	Non-Condensing Hot Water Boiler	1,970.00	Yes	1	Condensing Hot Water Boiler	1,970.00	93.00%	Et	0.00	0	237.9	$2,201.58	$37,625.67	$4,334.00	15.12
Boiler Room	Old Section	2	Non-Condensing Hot Water Boiler	1,800.00	Yes	2	Condensing Hot Water Boiler	1,800.00	93.00%	Et	0.00	0	418.4	$3,871.20	$68,757.56	$7,920.00	15.72

DHW Inventory & Recommendations

		Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	School Building	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Custodian Office	School Building	1	Storage Tank Water Heater (≤ 50 Gal)	Yes	1	Storage Tank Water Heater (≤ 50 Gal)	Natural Gas	82.00%	EF	1.35	13,716	-46.8	$1,188.06	$2,812.80	$50.00	2.33

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
School Restrooms	10	Faucet Aerator (Lavatory)	2.00	1.00	0.00	0	11.2	$104.06	$71.70	$0.00	0.69
School Restrooms	5	Faucet Aerator (Lavatory)	2.00	1.00	0.00	0	5.6	$52.03	$35.85	$0.00	0.69

Commercial Refrigerator/Freezer Inventory & Recommendations

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

Cooking Equipment Inventory & Recommendations

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

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
School	55	Desktop with LCD Monitor	191.0	Yes
School	2	Copy Machine	1,400.0	Yes
School	1	Water Fountain	225.0	Yes
School	5	Microwave	1,000.0	No
School	5	Refrigerator	255.0	Yes
School	7	Small printer	46.0	Yes
Kitchen	1	Electric Food Warmer	1,500.0	No
Room 1	1	Electric Range	1,500.0	No
School	83	Laptop Computer	45.0	Yes

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Drum Point Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 52,720
Built: 1961

For Year Ending: February 29, 2016
Date Generated: August 21, 2017

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Drum Point Elementary School 41 Drum Point Road Brick, New Jersey 08723	Brick Township Board of Education 101 Hendrickson Avenue Brick, NJ 08724 (732) 785-3000	James Edwards 101 Hendrickson Avenue Brick, NJ 08724 (732) 785-3000 jedwards@brickschools.org

Property ID: 6015278

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
112.3 kBtu/ft²

Source EUI
162.4 kBtu/ft²

Annual Energy by Fuel		
Electric - Grid (kBtu)	1,122,718 (19%)
Natural Gas (kBtu)	4,798,753 (81%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	81.4
National Median Source EUI (kBtu/ft²)	117.7
% Diff from National Median Source EUI	38%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	379

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)