



Local Government Energy Audit: Energy Audit Report



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Perth Amboy Campus

457 High Street

Perth Amboy, New Jersey 08861

Middlesex County Vocational School

District

October 30, 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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I EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPUB) has sponsored this Local Government Energy Audit (LGEA) Report for Perth Amboy Campus.

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

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

I.1 Facility Summary

Perth Amboy Campus is a 150,000 square-foot facility constructed in 2004. The building is a two-story educational facility including but not limited to classrooms, offices, hallways, and kitchen areas.

Lighting at the facility consists mainly of 32-Watt T8 fluorescent fixtures; all of which are inefficient when compared to the latest lighting technology available in the market. In addition to linear fluorescent technology, the facility also has several compact fluorescent, incandescent, high pressure sodium, and metal halide lamps, as well as LED exit signs. Interior lighting control is provided by manual switches. Exterior lighting at the facility is provided by a combination of metal halide, high pressure sodium, and compact fluorescent fixtures controlled photocells.

Cooling and ventilation is provided mainly by rooftop packaged AC units and make-up air units. Heating is mainly provided by four condensing hot water boilers as well as gas burners in package units.

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

I.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated eight measures and recommended five measures which together represent an opportunity for Perth Amboy Campus to reduce annual energy costs by roughly \$44,371 and annual greenhouse gas emissions by 355,654 lbs CO₂e. We estimate that if all measures were implemented as recommended, the project would pay for itself in roughly 5.5 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 Perth Amboy Campus's annual energy use by 8%.

Figure 1 – Previous 12 Month Utility Costs

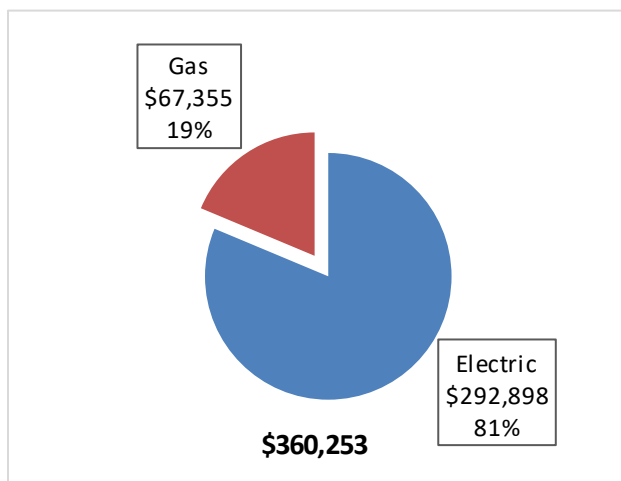
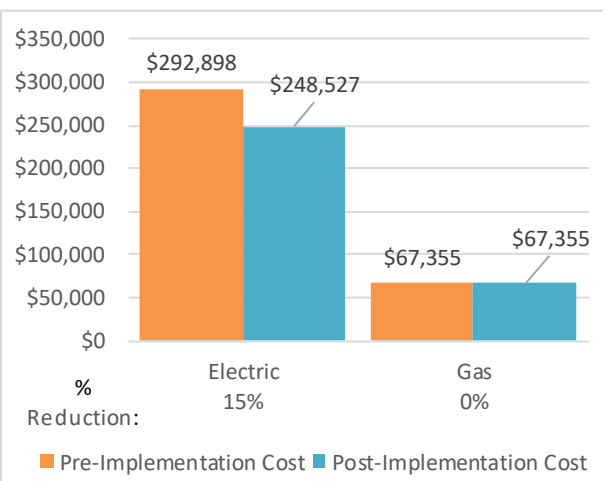


Figure 2 – Potential Post-Implementation Costs



A detailed description of Perth Amboy Campus’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 (MME)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)	
Lighting Upgrades											
ECM 1	Install LED Fixtures	Yes	44,013	6.8	0.0	\$5,529.42	\$47,134.08	\$400.00	\$46,734.08	8.5	44,321
ECM 2	Retrofit Fixtures with LED Lamps	Yes	235,920	48.0	0.0	\$29,639.20	\$157,833.63	\$24,130.00	\$133,703.63	4.5	237,570
Lighting Control Measures											
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	55,367	11.3	0.0	\$6,955.85	\$61,408.00	\$7,475.00	\$53,933.00	7.8	55,754
ECM 4	Install High/Low Lighting Controls	Yes	12,707	2.6	0.0	\$1,596.38	\$10,400.00	\$0.00	\$10,400.00	6.5	12,796
Electric Unitary HVAC Measures											
	Install High Efficiency Electric AC	No	91,310	60.1	0.0	\$11,471.48	\$1,186,792.54	\$13,133.29	\$1,173,659.24	102.3	91,948
	Install High Efficiency Packaged Terminal AC/HP	No	24,869	16.4	0.0	\$3,124.36	\$183,374.97	\$6,224.83	\$177,150.14	56.7	25,043
Gas Heating (HVAC/Process) Replacement											
	Install High Efficiency Furnaces	No	0	0.0	242.4	\$2,148.24	\$50,960.87	\$4,000.00	\$46,960.87	21.9	28,382
Plug Load Equipment Control - Vending Machine											
ECM 5	Vending Machine Control	Yes	5,178	0.0	0.0	\$650.53	\$920.00	\$0.00	\$920.00	1.4	5,214
TOTALS FOR HIGH PRIORITY MEASURES			353,185	68.7	0.0	\$44,371.38	\$277,695.71	\$32,005.00	\$245,690.71	5.5	355,654
TOTALS FOR ALL EVALUATED MEASURES			469,364	145.2	242.4	\$61,115.46	\$1,698,824.09	\$55,363.13	\$1,643,460.96	26.9	501,028

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

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

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

Lighting Control 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.

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 conditioning 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.

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

Energy Efficient Practices

TRC also identified 14 low cost (or no cost) energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at Perth Amboy Campus include:

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

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

On-Site Generation Measures

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

Figure 4 – Photovoltaic Potential

Potential	High	
System Potential	215	kW DC STC
Electric Generation	256,145	kWh/yr
Displaced Cost	\$22,280	/yr
Installed Cost	\$559,000	

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

I.3 Implementation Planning

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

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

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

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

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

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

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce electric loads at commercial facilities, when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and facilities receive payments if they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

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

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Karl Knehr	Business Administrator	knehrk@mail.mcvts.net	(732) 257-3300
TRC Energy Services			
Alexander Klieverik	Auditor	AKlieverik@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On February 27, 2018, TRC performed an energy audit at Perth Amboy Campus located in Perth Amboy, New Jersey. TRC’s team met with Karl Knehr and Francis Cap to review the facility operations and help focus our investigation on specific energy-using systems.

Perth Amboy Campus is a 150,000 square-foot facility constructed in 2004. The building is a two-story educational facility including but not limited to classrooms, offices, hallways, and kitchen areas.

2.3 Building Occupancy

The typical schedule is presented in the table below.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Perth Amboy Campus	Weekday	7:00 AM - 8:00 PM
Perth Amboy Campus	Weekend	unoccupied

2.4 Building Envelope

The construction of Perth Amboy campus building is typically of concrete masonry block with brick type exterior and double pane tinted windows with operable frames. Most of the roof sections are constructed using black surface built-up roofing material.

Figure 7 – Building Façade



2.5 On-Site Generation

Perth Amboy Campus 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 consists largely of 32-Watt T8 fluorescent fixtures. These sources are inefficient when compared to the latest lighting technology available in the market. Fluorescent T8 fixtures are 2-foot and 4-foot long linear, mainly troffers with diffusers having 1-lamp to 6-lamp configurations. In addition, there are several 26-Watt compact fluorescent fixtures with 1-lamp and 2-lamp configurations. Lighting at the facility also consist of 60-Watt incandescent lamps and 150-Watt metal halide fixtures serving the cafeteria and storage areas. All the exit signs are LED based fixtures.

Lighting control in the building is provided by manual switches.

Figure 8 - Building Lighting Systems



Exterior lighting at the facility is provided by 26-Watt compact fluorescent fixtures with 1-lamp and 2-lamp configurations, 150-Watt high-pressure sodium, 200-Watt metal halide, and 40-Watt wall mounted LED fixtures. Exterior lighting control is provided by photocells.

Hot Water Heating System

The hot water system consists of five Benchmark 2.0 2,000 kBtu/hr. output, condensing boilers however, one of the boilers is not operating. All the boilers have a nominal combustion efficiency of 91%. The boilers are configured in a variable flow primary distribution with two hot water pumps of each 40 HP capacity. Hot water from the boilers is circulated to re-heat coils in the zone side variable air volume boxes, hot water coils in package units, unit heaters, and heat recovery units.

In addition to the hot water system, heating at the facility is also provided by six gas-fired roof top package units and four make-up air units. Furnaces in the package units have capacities between 93 kBtu/hr. and 292 kBtu/hr. The units operate at efficiencies of around 81%.

Heating is also provided by gas fired systems inside the four make-up air units. Each unit has an output capacity of 300 kBtu/hr. with heating efficiency of 75%.

Figure 9 – Hot Water Systems



Direct Expansion Air Conditioning System (DX)

Cooling at the facility is provided by a combination of rooftop package units, heat recovery units, and make-up air units.

There is a total of 19 package units providing cooling at the building with capacities between 6-tons and 65-tons. All the package units operate at efficiencies between 8.6 to 11.1 EER. Package units utilize direct expansion (DX) refrigerant coils to provide cooling. The units are connected to zone side variable air volume boxes with re-heat coils. Supply fans at all the package units have variable frequency drives for demand based speed variation. The units have outside air economizers to utilize free cooling when the outside air temperature is lower than the return air temperature. Package units are also equipped with gas fired burners to provide heating to the building as described in the heating section of this report.

Figure 10 – Direct Expansion Air Conditioning Systems (DX)



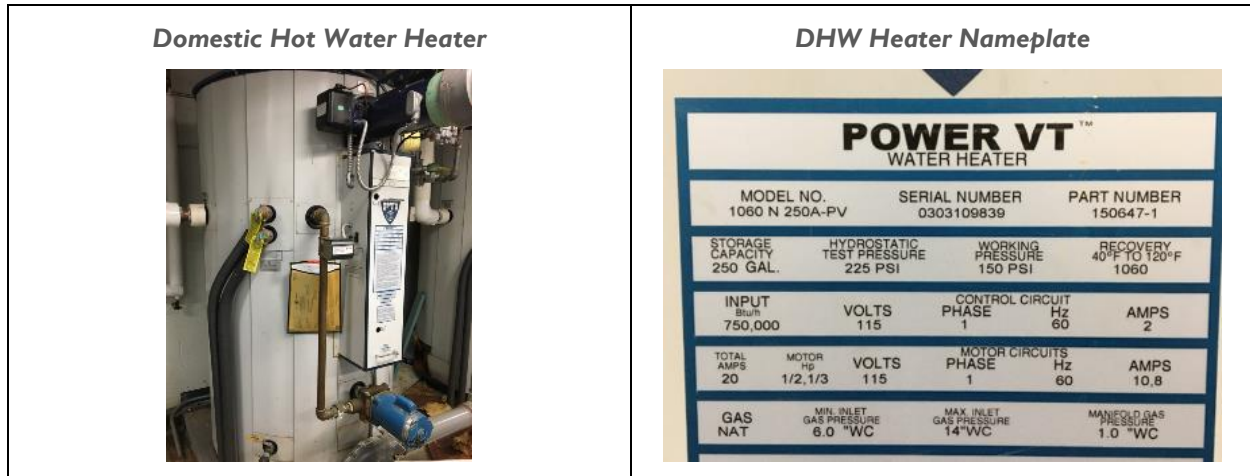
Cooling at the facility is also provided by four 24-ton make-up air units. Make-up air units provide a constant airflow of 4,500 CFM to the building spaces. Each unit has a 7.5 HP supply fan with constant speed operation due to lack of speed control. Cooling is provided by scroll compressors in the make-up air units. Additionally, the units have gas fired burners to provide heating as described in the heating section of this report.

There are two air-to-air heat recovery units with indirect heat exchangers that use exhaust air to precondition outside air being delivered to the kitchen. They have DX cooling components with a capacity of 15 tons, and hot water coils with an output capacity of 115 MBH to maintain the discharge temperature. Each heat recovery unit is equipped with a 3 HP supply fan that provides a constant supply of 3,200 CFM of conditioned air to the spaces. Heat exchanger provides heat addition and heat rejection during winter and summer months respectively.

Domestic Hot Water Heating System

The domestic hot water heating system at the facility consists of one Power VT hot water heater with an input rating of 750 kBtu/hr. and a nominal efficiency of 80%. The water heater has a 250-gallon storage tank.

Figure 11 – Domestic Hot Water Heater



Refrigeration

The facility has two solid door stand-up freezers of capacities between 16 – 30 cu. ft., one solid door stand-up refrigerator of capacity between 16 – 30 cu. ft., and one walk-in cooler of 1-ton capacity. The walk-in cooler has an evaporator unit with two fans operating at a constant speed condition.

Figure 12 – Refrigeration Equipment

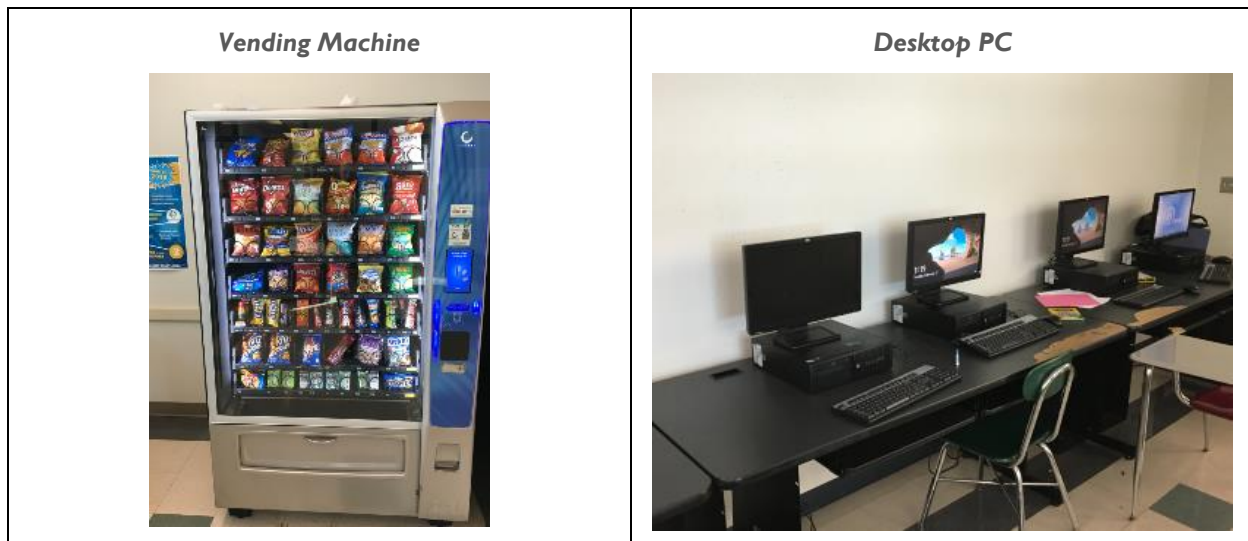


Building Plug Load

There are roughly 215 computer work stations throughout the facility. All the computers are desktop units with LCD monitors. There is no centralized PC power management software installed.

The facility contains other systems which contribute to plug load including printers, microwaves, televisions, etc. at the facility. In addition to the typical plug load equipment, the facility also has three refrigerated and one non-refrigerated vending machines.

Figure 13 – Building Plug-load Systems



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

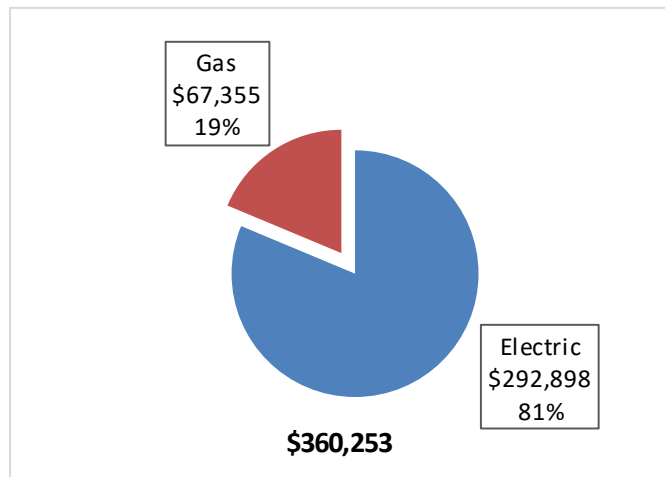
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 14 - Utility Summary

Utility Summary for Perth Amboy Campus		
Fuel	Usage	Cost
Electricity	2,331,396 kWh	\$292,898
Natural Gas	76,002 Therms	\$67,355
Total		\$360,253

The current annual energy cost for this facility is \$360,253 as shown in the chart below.

Figure 15 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by PSE&G. The average electric cost over the past 12 months was \$0.126/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 16 - Electric Usage & Demand

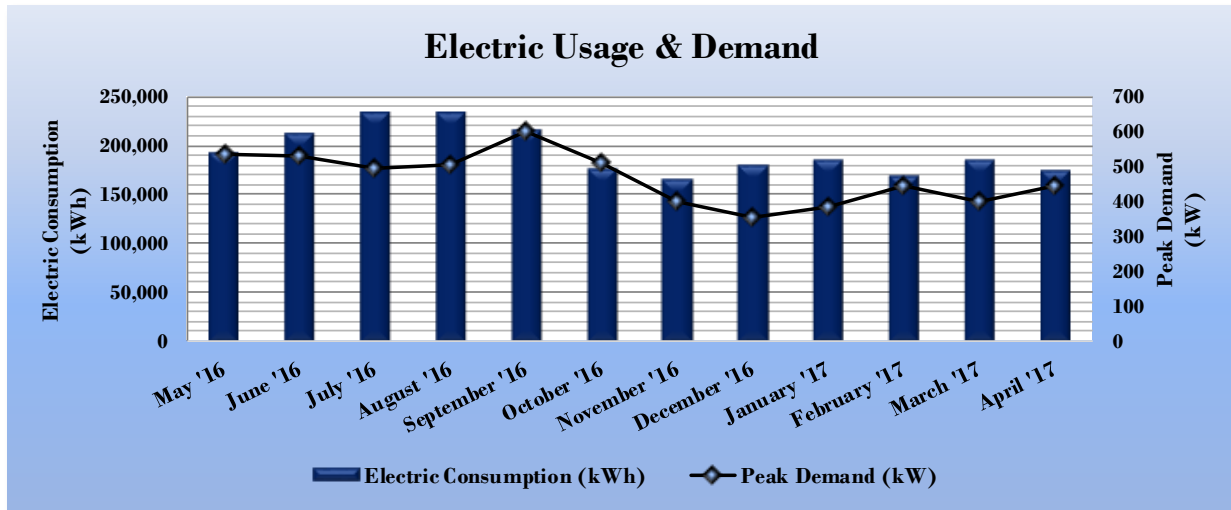


Figure 17 - Electric Usage & Demand

Electric Billing Data for Perth Amboy Campus					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
5/31/16	30	192,193	534	\$1,957	\$22,808
6/30/16	30	212,036	531	\$1,947	\$29,625
7/31/16	31	234,911	496	\$1,818	\$31,634
8/31/16	31	234,046	503	\$1,843	\$31,626
9/30/16	30	216,428	600	\$2,235	\$31,067
10/31/16	31	175,867	508	\$1,892	\$20,632
11/30/16	30	165,254	398	\$1,483	\$19,115
12/31/16	31	180,254	355	\$1,322	\$21,364
1/31/17	31	184,949	385	\$1,430	\$21,517
2/28/17	28	169,229	445	\$1,657	\$20,068
3/31/17	31	184,850	397	\$1,494	\$21,582
4/30/17	30	174,992	442	\$1,667	\$21,058
Totals	364	2,325,009	600.1	\$20,745	\$292,096
Annual	365	2,331,396	600.1	\$20,802	\$292,898

3.3 Natural Gas Usage

Natural gas is provided by Elizabethtown Gas. The average gas cost for the past 12 months is \$0.886/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 18 - Natural Gas Usage

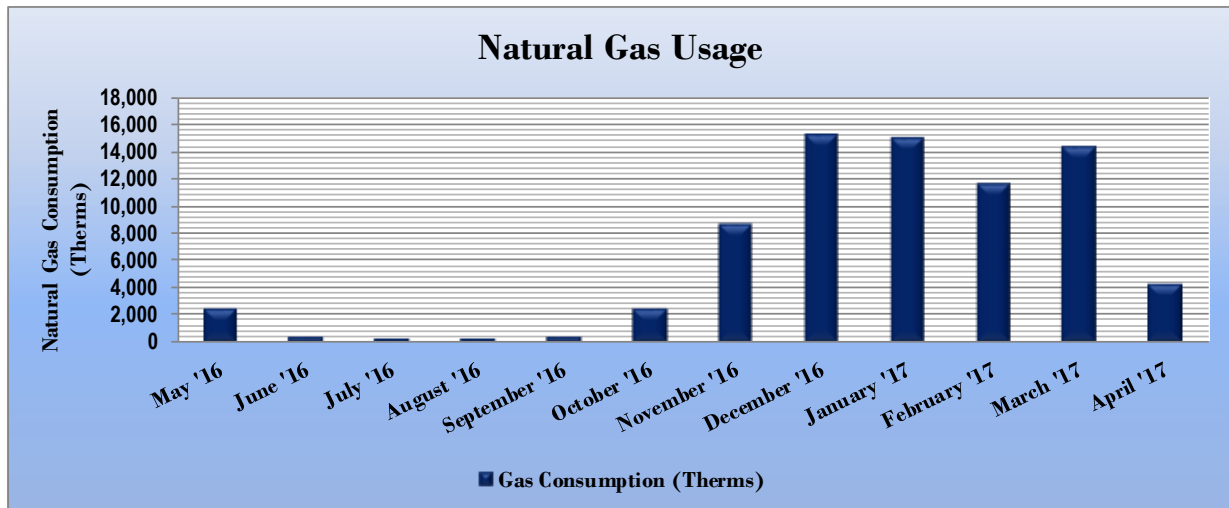


Figure 19 - Natural Gas Usage

Gas Billing Data for Perth Amboy Campus			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
6/1/16	31	2,515	\$2,828
7/1/16	30	475	\$1,448
8/1/16	31	299	\$1,338
9/1/16	31	268	\$1,296
10/1/16	30	371	\$1,365
11/1/16	31	2,493	\$2,901
12/1/16	30	8,681	\$7,389
1/1/17	31	15,310	\$11,997
2/1/17	31	15,105	\$11,809
3/1/17	28	11,740	\$9,423
4/1/17	31	14,445	\$11,341
5/1/17	30	4,299	\$4,220
Totals	365	76,002	\$67,355
Annual	365	76,002	\$67,355

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 20 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Perth Amboy Campus	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft ²)	219.7	141.4
Site Energy Use Intensity (kBtu/ft ²)	103.7	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 21 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Perth Amboy Campus	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft ²)	194.5	141.4
Site Energy Use Intensity (kBtu/ft ²)	95.7	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building’s energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 20.

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

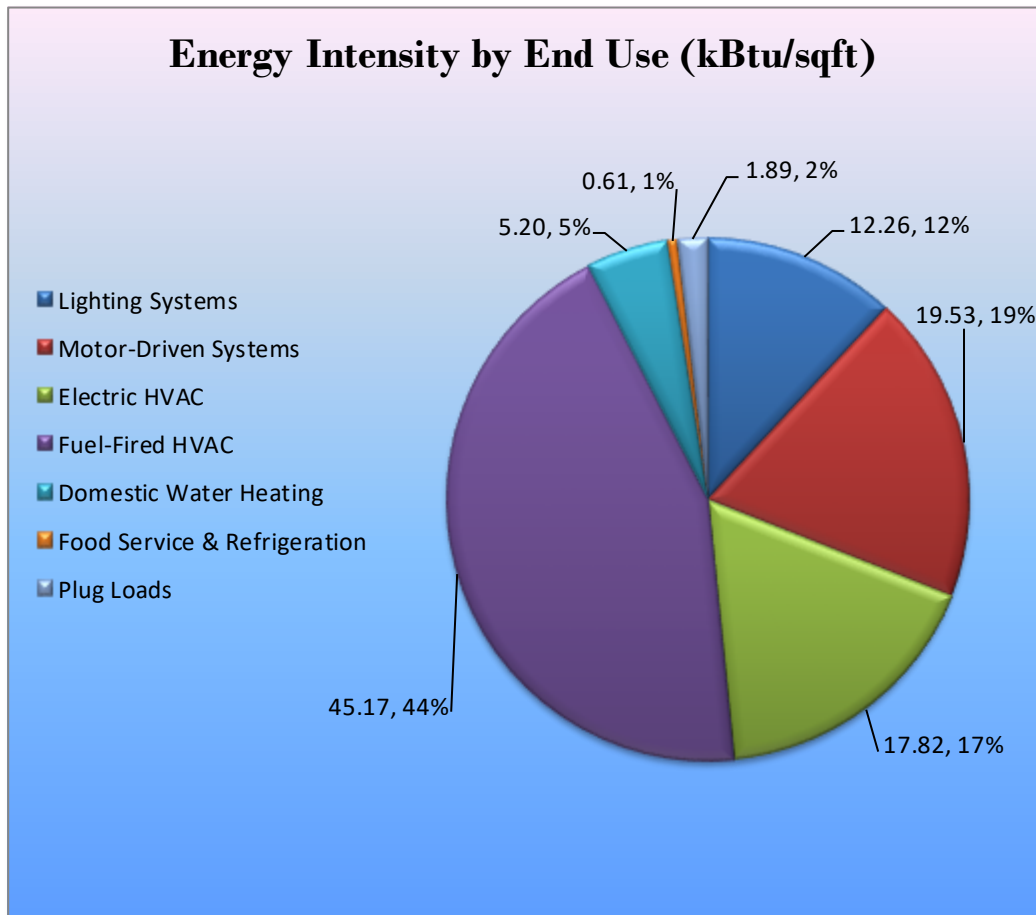
For more information on ENERGY STAR® certification go to: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1>.

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

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 23 – 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 ₂ e Emissions Reduction (lbs)
Lighting Upgrades		279,933	54.8	0.0	\$35,168.62	\$204,967.71	\$24,530.00	\$180,437.71	5.1	281,890
ECM 1	Install LED Fixtures	44,013	6.8	0.0	\$5,529.42	\$47,134.08	\$400.00	\$46,734.08	8.5	44,321
ECM 2	Retrofit Fixtures with LED Lamps	235,920	48.0	0.0	\$29,639.20	\$157,833.63	\$24,130.00	\$133,703.63	4.5	237,570
Lighting Control Measures		68,074	13.9	0.0	\$8,552.23	\$71,808.00	\$7,475.00	\$64,333.00	7.5	68,550
ECM 3	Install Occupancy Sensor Lighting Controls	55,367	11.3	0.0	\$6,955.85	\$61,408.00	\$7,475.00	\$53,933.00	7.8	55,754
ECM 4	Install High/Low Lighting Controls	12,707	2.6	0.0	\$1,596.38	\$10,400.00	\$0.00	\$10,400.00	6.5	12,796
Plug Load Equipment Control - Vending Machine		5,178	0.0	0.0	\$650.53	\$920.00	\$0.00	\$920.00	1.4	5,214
ECM 5	Vending Machine Control	5,178	0.0	0.0	\$650.53	\$920.00	\$0.00	\$920.00	1.4	5,214
TOTALS		353,185	68.7	0.0	\$44,371.38	\$277,695.71	\$32,005.00	\$245,690.71	5.5	355,654

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

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

4.1.1 Lighting Upgrades

Our recommendations for upgrades to existing lighting fixtures are summarized in Figure 24 below.

Figure 24 – 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 ₂ e Emissions Reduction (lbs)
Lighting Upgrades		279,933	54.8	0.0	\$35,168.62	\$204,967.71	\$24,530.00	\$180,437.71	5.1	281,890
ECM 1	Install LED Fixtures	44,013	6.8	0.0	\$5,529.42	\$47,134.08	\$400.00	\$46,734.08	8.5	44,321
ECM 2	Retrofit Fixtures with LED Lamps	235,920	48.0	0.0	\$29,639.20	\$157,833.63	\$24,130.00	\$133,703.63	4.5	237,570

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 ₂ e Emissions Reduction (lbs)
Interior	15,143	3.1	0.0	\$1,902.49	\$21,908.88	\$180.00	\$21,728.88	11.4	15,249
Exterior	28,869	3.8	0.0	\$3,626.93	\$25,225.20	\$220.00	\$25,005.20	6.9	29,071

Measure Description

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

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a metal halide or a high-pressure sodium lamp.

ECM 2: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	233,836	47.7	0.0	\$29,377.38	\$155,723.88	\$24,130.00	\$131,593.88	4.5	235,471
Exterior	2,084	0.3	0.0	\$261.82	\$2,109.74	\$0.00	\$2,109.74	8.1	2,099

Measure Description

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

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

4.1.2 Lighting Control Measures

Our recommendations for lighting control measures are summarized in Figure 25 below.

Figure 25 – 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 ₂ e Emissions Reduction (lbs)
Lighting Control Measures		68,074	13.9	0.0	\$8,552.23	\$71,808.00	\$7,475.00	\$64,333.00	7.5	68,550
ECM 3	Install Occupancy Sensor Lighting Controls	55,367	11.3	0.0	\$6,955.85	\$61,408.00	\$7,475.00	\$53,933.00	7.8	55,754
ECM 4	Install High/Low Lighting Controls	12,707	2.6	0.0	\$1,596.38	\$10,400.00	\$0.00	\$10,400.00	6.5	12,796

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

ECM 3: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
55,367	11.3	0.0	\$6,955.85	\$61,408.00	\$7,475.00	\$53,933.00	7.8	55,754

Measure Description

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

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

ECM 4: Install High/Low Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
12,707	2.6	0.0	\$1,596.38	\$10,400.00	\$0.00	\$10,400.00	6.5	12,796

Measure Description

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

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

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

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

4.1.3 Plug Load Equipment Control - Vending Machines

Our recommendations for plug load equipment controls are summarized in Figure 26 below.

Figure 26-Summary of Plug Load Equipment Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine		5,178	0.0	0.0	\$650.53	\$920.00	\$0.00	\$920.00	1.4	5,214
ECM 5	Vending Machine Control	5,178	0.0	0.0	\$650.53	\$920.00	\$0.00	\$920.00	1.4	5,214

ECM 5: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
5,178	0.0	0.0	\$650.53	\$920.00	\$0.00	\$920.00	1.4	5,214

Measure Description

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

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 27 – 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 ₂ e Emissions Reduction (lbs)
Electric Unitary HVAC Measures	116,179	76.5	0.0	\$14,595.84	\$1,370,167.51	\$19,358.13	\$1,350,809.38	92.5	116,991
Install High Efficiency Electric AC	91,310	60.1	0.0	\$11,471.48	\$1,186,792.54	\$13,133.29	\$1,173,659.24	102.3	91,948
Install High Efficiency Packaged Terminal AC/HP	24,869	16.4	0.0	\$3,124.36	\$183,374.97	\$6,224.83	\$177,150.14	56.7	25,043
Gas Heating (HVAC/Process) Replacement	0	0.0	242.4	\$2,148.24	\$50,960.87	\$4,000.00	\$46,960.87	21.9	28,382
Install High Efficiency Furnaces	0	0.0	242.4	\$2,148.24	\$50,960.87	\$4,000.00	\$46,960.87	21.9	28,382
TOTALS	116,179	76.5	242.4	\$16,744.08	\$1,421,128.38	\$23,358.13	\$1,397,770.26	83.5	145,374

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

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

Install High Efficiency 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 ₂ e Emissions Reduction (lbs)
91,310	60.1	0.0	\$11,471.48	\$1,186,792.54	\$13,133.29	\$1,173,659.24	102.3	91,948

Measure Description

We evaluated replacing standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. 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.

Reasons for not Recommending

The packaged units have relatively low use hours and also high cost of installation. This factor results in a long payback for the measure, more than the rated useful life of the replacement equipment. The measure is not recommended for implementation based on energy savings alone.

Install High Efficiency PTAC/PTHP

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 ₂ e Emissions Reduction (lbs)
24,869	16.4	0.0	\$3,124.36	\$183,374.97	\$6,224.83	\$177,150.14	56.7	25,043

Measure Description

We evaluated replacing packaged terminal air conditioners with high efficiency PTAC. 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 and a higher HPSF rating indicates more efficient heating mode for heat pumps. 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 heating and cooling loads, and the estimated annual operating hours.

Reasons for not Recommending

The make-up air units have relatively low use hours and also high cost of installation. This factor results in a long payback for the measure, more than the rated useful life of the replacement equipment. The measure is not recommended for implementation based on energy savings alone.

Install High Efficiency Furnaces

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 ₂ e Emissions Reduction (lbs)
0	0.0	242.4	\$2,148.24	\$50,960.87	\$4,000.00	\$46,960.87	21.9	28,382

Measure Description

We evaluated replacing existing standard efficiency furnaces with high efficiency furnaces. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases which can significantly improve furnace efficiency. Savings result from improved system efficiency.

Reasons for not Recommending

The furnaces/package units have relatively low use hours. This factor results in a long payback for the measure, more than the rated useful life of the replacement equipment. The measure is not recommended for implementation based on energy savings alone.

5 ENERGY EFFICIENT PRACTICES

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

Perform Proper Lighting Maintenance

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

Develop a Lighting Maintenance Schedule

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

Perform Routine Motor Maintenance

Motors consist of many moving parts whose collective degradation can contribute to a significant loss of motor efficiency. 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.

Ensure Economizers are Functioning Properly

Economizers, when properly configured, can be used to significantly reduce mechanical cooling. However, if the outdoor thermostat or enthalpy control is malfunctioning or the damper is stuck or improperly adjusted, benefits from the economizer may not be fully realized. As such, periodic inspection and maintenance is required to ensure proper operation. This maintenance should be scheduled with maintenance of the facility's air conditioning system and should include proper setting of the outdoor thermostat/enthalpy control, inspection of control and damper operation, lubrication of damper connections, and adjustment of minimum damper position. A malfunctioning economizer can significantly increase the amount of heating and mechanical cooling required by introducing excess amounts of cold or hot outside air.

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 Regular 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 Regular Gas Burner Maintenance

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

Perform Proper Water Heater Maintenance

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

Plug Load Controls

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

Replace Computer Monitors

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

Water Conservation

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

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

6 ON-SITE GENERATION MEASURES

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

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

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

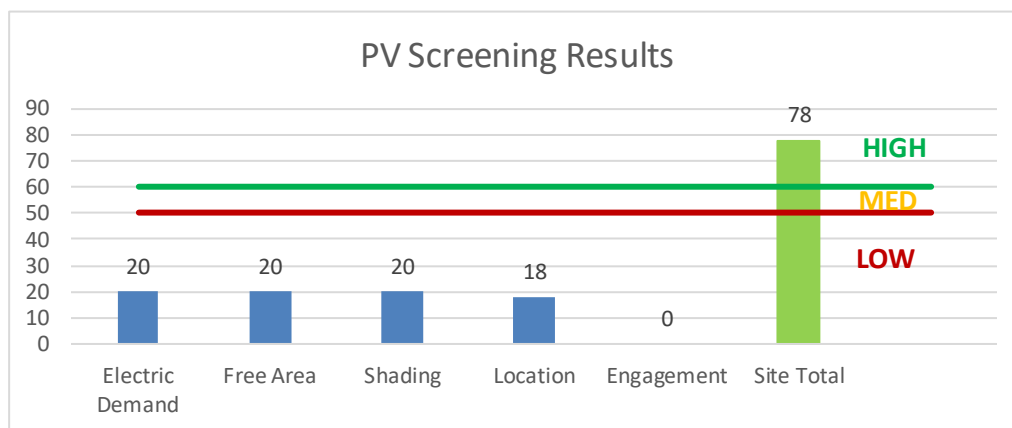
6.1 Photovoltaic

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

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

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the high potential for PV at the site. A PV array located on the roof of the building may be feasible. If Perth Amboy Campus is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 28 - Photovoltaic Screening



Potential	High	
System Potential	215	kW DC STC
Electric Generation	256,145	kWh/yr
Displaced Cost	\$22,280	/yr
Installed Cost	\$559,000	

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

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

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

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 space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for 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.

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 if their facility is called upon to curtail their electric usage.

Typically, an electric customer needs to can reduce their electric demand, within minutes, by at least 100 kW or more 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, 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 a Demand Response measure.

8 PROJECT FUNDING / INCENTIVES

The NJCEP provides 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 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 29 for a list of the eligible programs identified for each recommended ECM.

Figure 29 - ECM Incentive Program Eligibility

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

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

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

Brief descriptions of all relevant financing and incentive programs are 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 apply 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 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 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.

8.3 Energy Savings Improvement Program

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

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

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

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

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

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 could 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 of 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 monthly. 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 of 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

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Rm	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Boiler Rm	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.57	2,815	0.0	\$353.62	\$1,768.50	\$280.00	4.21
HVAC shop	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
HVAC shop	52	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	52	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	1.42	6,970	0.0	\$875.63	\$4,392.00	\$695.00	4.22
HVAC shop RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
B210 CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B210 CR	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.86	4,222	0.0	\$530.43	\$2,119.20	\$385.00	3.27
B210 A1 CR	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.16	804	0.0	\$101.03	\$570.80	\$95.00	4.71
B211 CR	19	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	19	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.78	3,820	0.0	\$479.91	\$1,968.80	\$355.00	3.36
B211 CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B213	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.14	670	0.0	\$84.20	\$562.50	\$85.00	5.67
School Store	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.16	804	0.0	\$101.03	\$570.80	\$95.00	4.71
B220 CR	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.53	2,614	0.0	\$328.36	\$1,247.60	\$230.00	3.10
B220 CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B220A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.16	804	0.0	\$101.03	\$570.80	\$95.00	4.71
B221	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.74	3,619	0.0	\$454.65	\$1,893.60	\$340.00	3.42
B221	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B222 CR	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.74	3,619	0.0	\$454.65	\$1,893.60	\$340.00	3.42
B222 CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B222A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.16	804	0.0	\$101.03	\$570.80	\$95.00	4.71
B223	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.74	3,619	0.0	\$454.65	\$1,893.60	\$340.00	3.42
B223	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B215 CR	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	1.23	6,032	0.0	\$757.76	\$3,066.00	\$555.00	3.31
B215 CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B215B	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.49	2,413	0.0	\$303.10	\$1,172.40	\$215.00	3.16

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
B216	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	1.23	6,032	0.0	\$757.76	\$3,066.00	\$555.00	3.31
B216	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
BOYS RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.06	281	0.0	\$35.29	\$413.60	\$55.00	10.16
BOYS RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
GIRS RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.06	281	0.0	\$35.29	\$413.60	\$55.00	10.16
GIRS RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.11	536	0.0	\$67.36	\$504.00	\$75.00	6.37
Cafeteria	81	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	81	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	2.21	10,857	0.0	\$1,363.96	\$6,898.50	\$1,090.00	4.26
Cafeteria	6	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	6	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Cafeteria	24	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	24	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.42	2,046	0.0	\$257.02	\$2,649.74	\$70.00	10.04
Cafeteria	9	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	9	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.16	767	0.0	\$96.38	\$1,061.15	\$35.00	10.65
Cafeteria	14	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	14	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.24	1,193	0.0	\$149.93	\$1,770.68	\$70.00	11.34
Cafeteria	24	Metal Halide: (1) 175W Lamp	Wall Switch	215	2,795	Fixture Replacement	Yes	24	LED - Fixtures: Downlight Pendant	Occupancy Sensor	65	1,957	2.67	13,103	0.0	\$1,646.10	\$15,145.92	\$190.00	9.09
Vending Are	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Storage	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.33	1,608	0.0	\$202.07	\$972.00	\$120.00	4.22
IT Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Storage 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Kitchen	20	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,795	Relamp	Yes	20	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,957	0.28	1,356	0.0	\$170.41	\$1,504.00	\$270.00	7.24
Kitchen	8	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	8	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.14	682	0.0	\$85.67	\$973.25	\$35.00	10.95
Kitchen	9	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	9	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.16	767	0.0	\$96.38	\$1,061.15	\$35.00	10.65
Kitchen	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.55	2,681	0.0	\$336.78	\$1,710.00	\$270.00	4.28
Office B207	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$233.00	\$40.00	5.73
Mens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Womens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$30.00	8.22
Back Kitchen	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hallway	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	0.30	1,474	0.0	\$185.23	\$843.50	\$110.00	3.96
Kitchen CR	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen CR	23	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	23	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.94	4,624	0.0	\$580.95	\$2,269.60	\$415.00	3.19
Office 208E	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$233.00	\$40.00	5.73
Kitchen CR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,795	0.01	56	0.0	\$7.07	\$35.90	\$5.00	4.37
Laundry	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Mens Locker RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Womens Locker RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Lunch Kitchen	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,957	0.03	136	0.0	\$17.04	\$212.40	\$40.00	10.12
Area CR	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.33	1,608	0.0	\$202.07	\$871.60	\$155.00	3.55
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$387.00	\$20.00	10.90
Area CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Electrical Rm	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,795	0.03	159	0.0	\$19.99	\$75.20	\$15.00	3.01
C 153 CR	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.70	3,418	0.0	\$429.39	\$1,818.40	\$325.00	3.48
C 153 CR	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.16	804	0.0	\$101.03	\$570.80	\$95.00	4.71
C 152 CR	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.70	3,418	0.0	\$429.39	\$1,818.40	\$325.00	3.48
C 152 CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
WOMENS RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.03	140	0.0	\$17.65	\$341.80	\$45.00	16.82
WOMENS RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
JANITOR CLOSET	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
MENS RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.06	281	0.0	\$35.29	\$413.60	\$55.00	10.16
MENS RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
GYM	24	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	176	2,795	Relamp	Yes	24	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	1,957	1.81	8,879	0.0	\$1,115.49	\$4,301.36	\$860.00	3.09
GYM	5	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
GYM STORAGE	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$30.00	8.22
GYM STORAGE	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.14	670	0.0	\$84.20	\$562.50	\$50.00	6.09
Girls Locker	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Girls Locker	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.38	1,876	0.0	\$235.75	\$1,359.00	\$210.00	4.87
Girls Locker	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.16	804	0.0	\$101.03	\$621.00	\$95.00	5.21
Team Rm	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.16	804	0.0	\$101.03	\$621.00	\$95.00	5.21
Gym Locker Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.14	670	0.0	\$84.20	\$562.50	\$85.00	5.67
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Fitness Center	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.49	2,413	0.0	\$303.10	\$1,593.00	\$250.00	4.43
Fitness Center	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Boys Locker	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.55	2,681	0.0	\$336.78	\$1,710.00	\$270.00	4.28
Boys Locker	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Team Rm	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.16	804	0.0	\$101.03	\$621.00	\$95.00	5.21
Coach's Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.14	670	0.0	\$84.20	\$562.50	\$85.00	5.67
Coach's Office	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$387.00	\$55.00	9.86
C161	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.25	1,206	0.0	\$151.55	\$796.50	\$125.00	4.43
C161	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
C161C	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.11	536	0.0	\$67.36	\$504.00	\$75.00	6.37
C161B	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$233.00	\$40.00	5.73
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
C139	45	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	45	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	1.85	9,047	0.0	\$1,136.63	\$4,464.00	\$815.00	3.21
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,795	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,795	0.04	180	0.0	\$22.61	\$95.13	\$20.00	3.32

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Storage	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Mens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Mens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.04	211	0.0	\$26.47	\$377.70	\$50.00	12.38
Womens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Womens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.04	211	0.0	\$26.47	\$377.70	\$50.00	12.38
164 CADD	38	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	38	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	1.56	7,640	0.0	\$959.82	\$3,667.60	\$675.00	3.12
164 CADD	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B132	36	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	36	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	1.48	7,238	0.0	\$909.31	\$3,517.20	\$645.00	3.16
B132	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B132	8	Incandescent INC-60W	Wall Switch	60	2,795	Relamp	Yes	8	LED Screw-In Lamps: LED - 9W	Occupancy Sensor	9	1,957	0.28	1,381	0.0	\$173.48	\$621.62	\$75.00	3.15
B131CR	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	22	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.90	4,423	0.0	\$555.69	\$2,194.40	\$400.00	3.23
B131CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Construction Lab	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.25	1,206	0.0	\$151.55	\$721.20	\$125.00	3.93
Construction Lab	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Construction Lab	54	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	54	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	1.48	7,238	0.0	\$909.31	\$4,509.00	\$715.00	4.17
Exit Area	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.11	536	0.0	\$67.36	\$504.00	\$75.00	6.37
Exit Area	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Woodshop	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Woodshop	48	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	48	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	1.31	6,434	0.0	\$808.27	\$3,888.00	\$620.00	4.04
Woodshop	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$233.00	\$40.00	5.73
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Electrical Lab	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.66	3,217	0.0	\$404.14	\$1,944.00	\$310.00	4.04
Electrical Lab	25	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	25	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.68	3,351	0.0	\$420.98	\$2,002.50	\$320.00	4.00
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
RR	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B117	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B117	86	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	86	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	2.35	11,527	0.0	\$1,448.16	\$7,191.00	\$1,140.00	4.18
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.11	536	0.0	\$67.36	\$504.00	\$40.00	6.89
Tool Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.11	536	0.0	\$67.36	\$504.00	\$40.00	6.89
B116 Maintenance Shop	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.66	3,217	0.0	\$404.14	\$1,944.00	\$310.00	4.04
Emergency Exit	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Emergency Exit	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$233.00	\$40.00	5.73
B114CR	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.74	3,619	0.0	\$454.65	\$1,893.60	\$340.00	3.42
B114CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B114A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.16	804	0.0	\$101.03	\$570.80	\$95.00	4.71
B113CR	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.74	3,619	0.0	\$454.65	\$1,893.60	\$340.00	3.42
B113CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B112CR	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.74	3,619	0.0	\$454.65	\$1,893.60	\$340.00	3.42
B112CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B112A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.16	804	0.0	\$101.03	\$570.80	\$95.00	4.71
B111CR	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.74	3,619	0.0	\$454.65	\$1,893.60	\$340.00	3.42
B111CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
B130T	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.08	402	0.0	\$50.52	\$420.40	\$65.00	7.04
B130T	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
B130A	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,795	0.03	159	0.0	\$19.99	\$75.20	\$15.00	3.01
B124 Center	33	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	33	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	1.35	6,635	0.0	\$833.53	\$3,291.60	\$600.00	3.23
B124 Center	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Electrical/Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$387.00	\$20.00	10.90
B124B	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.16	804	0.0	\$101.03	\$570.80	\$95.00	4.71
B124A	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.25	1,206	0.0	\$151.55	\$721.20	\$125.00	3.93
A104I	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.25	1,206	0.0	\$151.55	\$721.20	\$125.00	3.93
A104j	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.49	2,413	0.0	\$303.10	\$1,172.40	\$215.00	3.16
Storage 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$233.00	\$40.00	5.73
Storage 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$30.00	8.22
A104F	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.25	1,206	0.0	\$151.55	\$721.20	\$125.00	3.93
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Main Office RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Vault	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
A104M	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.33	1,608	0.0	\$202.07	\$871.60	\$155.00	3.55
A104M	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
A104D	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.25	1,206	0.0	\$151.55	\$721.20	\$125.00	3.93
A104C	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.41	2,011	0.0	\$252.59	\$1,022.00	\$185.00	3.31
A104C	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main Office Area	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.49	2,413	0.0	\$303.10	\$1,172.40	\$215.00	3.16
Main Office Area	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main Office Area	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.14	670	0.0	\$84.20	\$562.50	\$85.00	5.67
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Storage 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Stairwell 1	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	0.25	1,206	0.0	\$151.55	\$726.50	\$90.00	4.20
Stairwell 1	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
A110 Faculty Rm Mens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
A110 Faculty Rm Womens RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Lounge	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.49	2,413	0.0	\$303.10	\$1,172.40	\$215.00	3.16
A110D	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	22	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.90	4,423	0.0	\$555.69	\$2,194.40	\$400.00	3.23
A110D	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
A109 Wellness Center	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.38	1,876	0.0	\$235.75	\$1,359.00	\$210.00	4.87
A109 Wellness Center	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$387.00	\$20.00	10.90
Exam Rm	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,795	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,957	0.10	472	0.0	\$59.28	\$460.27	\$75.00	6.50
Exam Rm RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Exam Rm RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.04	211	0.0	\$26.47	\$377.70	\$50.00	12.38
A101CR	26	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	26	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	1.07	5,227	0.0	\$656.72	\$2,765.20	\$495.00	3.46
A101CR	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Womens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Womens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.04	211	0.0	\$26.47	\$377.70	\$50.00	12.38
JANITOR CLOSET	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Mens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Mens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.04	211	0.0	\$26.47	\$377.70	\$50.00	12.38
Media Center	14	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	14	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.24	1,193	0.0	\$149.93	\$1,770.68	\$70.00	11.34
Media Center	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Media Center	41	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	41	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	1.68	8,243	0.0	\$1,035.60	\$4,163.20	\$755.00	3.29
103C	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
103B Tech Support	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$30.00	8.22
Storage	12	Metal Halide: (1) 175W Lamp	Wall Switch	215	2,795	Fixture Replacement	Yes	12	LED - Fixtures: Downlight Pendant	Occupancy Sensor	65	1,957	1.34	6,551	0.0	\$823.05	\$7,572.96	\$60.00	9.13
Storage	8	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,795	Relamp	Yes	8	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,957	0.11	543	0.0	\$68.16	\$655.60	\$80.00	8.44

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Entry Foyer	4	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	4	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.07	341	0.0	\$42.84	\$621.62	\$35.00	13.69
Entry Foyer	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Entry Foyer	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,795	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,957	0.29	1,416	0.0	\$177.84	\$840.80	\$155.00	3.86
Entry Foyer	1	Compact Fluorescent: CFL - 1L - 26W	Wall Switch	26	2,795	Relamp	No	1	LED Screw-In Lamps: LED - 18W	Wall Switch	18	2,795	0.01	25	0.0	\$3.15	\$43.95	\$0.00	13.95
Exterior	11	Compact Fluorescent: CFL - 1L - 26W	Daylight Dimming	26	4,380	Relamp	No	11	LED Screw-In Lamps: LED - 18W	Daylight Dimming	18	4,380	0.06	432	0.0	\$54.30	\$483.48	\$0.00	8.90
Exterior	23	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	4,380	None	No	23	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	40	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Exterior	12	Compact Fluorescent: CFL - 2L - 26W	Daylight Dimming	52	4,380	Relamp	No	12	LED Screw-In Lamps: LED - 36W	Daylight Dimming	36	4,380	0.12	943	0.0	\$118.46	\$1,054.87	\$0.00	8.90
Exterior	13	Compact Fluorescent: CFL - 2L - 26W	Daylight Dimming	52	4,380	Relamp	No	13	LED Screw-In Lamps: LED - 36W	Daylight Dimming	36	4,380	0.13	1,022	0.0	\$128.33	\$571.39	\$0.00	4.45
Entry Foyer	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Entry Hall	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$233.00	\$40.00	5.73
Stairwell	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	0.14	670	0.0	\$84.20	\$492.50	\$50.00	5.26
Main Office	6	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	6	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.10	511	0.0	\$64.25	\$797.44	\$35.00	11.87
Main Office	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main Office	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.27	1,340	0.0	\$168.39	\$855.00	\$135.00	4.28
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
A202	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.08	402	0.0	\$50.52	\$420.40	\$65.00	7.04
A203	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.08	402	0.0	\$50.52	\$420.40	\$65.00	7.04
A208	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.08	402	0.0	\$50.52	\$420.40	\$65.00	7.04
A206	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.11	536	0.0	\$67.36	\$504.00	\$75.00	6.37
Kitchen	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.08	402	0.0	\$50.52	\$420.40	\$65.00	7.04
A204	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.08	402	0.0	\$50.52	\$420.40	\$65.00	7.04
A205	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.16	804	0.0	\$101.03	\$570.80	\$95.00	4.71
Computer Lab	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.33	1,608	0.0	\$202.07	\$871.60	\$155.00	3.55
Staff RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
A212 CR	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.52	2,547	0.0	\$319.94	\$1,651.50	\$260.00	4.35

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
A212 CR	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
A213 CR	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.25	1,206	0.0	\$151.55	\$796.50	\$125.00	4.43
A215 CR	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.33	1,608	0.0	\$202.07	\$871.60	\$155.00	3.55
A217 CR	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.33	1,608	0.0	\$202.07	\$871.60	\$155.00	3.55
A219 CR	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.33	1,608	0.0	\$202.07	\$871.60	\$155.00	3.55
A221 CR	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.33	1,608	0.0	\$202.07	\$871.60	\$155.00	3.55
A223 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.33	1,608	0.0	\$202.07	\$972.00	\$155.00	4.04
Storage Rm	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.05	268	0.0	\$33.68	\$387.00	\$20.00	10.90
Student Lounge	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.22	1,072	0.0	\$134.71	\$738.00	\$115.00	4.62
A226 MPR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.33	1,608	0.0	\$202.07	\$972.00	\$155.00	4.04
A224 Comp Lab	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.86	4,222	0.0	\$530.43	\$2,119.20	\$385.00	3.27
A224 Comp Lab	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.12	603	0.0	\$75.78	\$495.60	\$45.00	5.95
Mens RR	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.09	421	0.0	\$52.94	\$485.40	\$65.00	7.94
Mens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Custodial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Womens RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.08	402	0.0	\$50.52	\$445.50	\$65.00	7.53
Womens RR	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,957	0.09	421	0.0	\$52.94	\$485.40	\$65.00	7.94
A216 ESL	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,795	Relamp	Yes	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,957	0.86	4,222	0.0	\$530.43	\$2,119.20	\$385.00	3.27
A214 CR	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,957	0.22	1,072	0.0	\$134.71	\$738.00	\$115.00	4.62
MCC entry	11	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	11	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.19	938	0.0	\$117.80	\$1,236.97	\$35.00	10.20
MCC entry	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main Hallway	6	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	6	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main Hallway	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	26	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	0.71	3,485	0.0	\$437.81	\$2,121.00	\$260.00	4.25
Main Hallway	3	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	No	3	LED Screw-In Lamps: LED - 36W	Wall Switch	36	2,795	0.03	150	0.0	\$18.90	\$263.72	\$0.00	13.95

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Main Hallway	8	Compact Fluorescent: CFL - 1L - 26W	Wall Switch	26	2,795	Relamp	Yes	8	LED Screw-In Lamps: LED - 18W	High/Low Control	18	1,957	0.07	341	0.0	\$42.84	\$551.62	\$0.00	12.88
Hallway 1 floor	22	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	22	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hallway 1 floor	20	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	20	LED Screw-In Lamps: LED - 36W	High/Low Control	36	1,957	0.35	1,705	0.0	\$214.18	\$2,158.12	\$0.00	10.08
Hallway 1 floor	62	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	62	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	1.69	8,310	0.0	\$1,044.02	\$4,827.00	\$620.00	4.03
Hallway 1 floor	17	Compact Fluorescent: CFL - 1L - 26W	Wall Switch	26	2,795	Relamp	Yes	17	LED Screw-In Lamps: LED - 18W	High/Low Control	18	1,957	0.15	725	0.0	\$91.03	\$1,147.20	\$0.00	12.60
Hallway 1 floor	54	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	54	LED Screw-In Lamps: LED - 36W	High/Low Control	36	1,957	0.94	4,603	0.0	\$578.29	\$5,746.92	\$0.00	9.94
Hallway 1 floor	70	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	70	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	1.91	9,382	0.0	\$1,178.73	\$5,495.00	\$700.00	4.07
Hallway 1 floor	26	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	26	LED Screw-In Lamps: LED - 36W	High/Low Control	36	1,957	0.45	2,216	0.0	\$278.44	\$2,885.56	\$0.00	10.36
Hallway 1 floor	4	Compact Fluorescent: CFL - 1L - 26W	Wall Switch	26	2,795	Relamp	No	4	LED Screw-In Lamps: LED - 18W	Wall Switch	18	2,795	0.02	100	0.0	\$12.60	\$175.81	\$0.00	13.95
Hallway 1 floor	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,795	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,957	0.11	562	0.0	\$70.59	\$487.20	\$40.00	6.34
Gym Entry Foyer	4	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	4	LED Screw-In Lamps: LED - 36W	Occupancy Sensor	36	1,957	0.07	341	0.0	\$42.84	\$621.62	\$35.00	13.69
Stairwell 3	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	0.30	1,474	0.0	\$185.23	\$843.50	\$110.00	3.96
Stairwell 3	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Mech Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,795	0.02	106	0.0	\$13.33	\$58.50	\$10.00	3.64
Stairwell 4	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	0.44	2,145	0.0	\$269.42	\$1,336.00	\$160.00	4.36
Stairwell 4	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Stairwell 3	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	0.19	938	0.0	\$117.87	\$609.50	\$70.00	4.58
Stairwell 3	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Stairwell 2	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	0.25	1,206	0.0	\$151.55	\$726.50	\$90.00	4.20
Stairwell 2	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hallway 2 floor	12	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	12	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Hallway 2 floor	66	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,795	Relamp	Yes	66	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,957	1.80	8,846	0.0	\$1,111.37	\$5,061.00	\$660.00	3.96
Hallway 2 floor	55	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	55	LED Screw-In Lamps: LED - 36W	High/Low Control	36	1,957	0.96	4,688	0.0	\$589.00	\$5,834.83	\$0.00	9.91
Hallway 2 floor	16	Compact Fluorescent: CFL - 1L - 26W	Wall Switch	26	2,795	Relamp	Yes	16	LED Screw-In Lamps: LED - 18W	High/Low Control	18	1,957	0.14	682	0.0	\$85.67	\$1,103.25	\$0.00	12.88
Hallway 2 floor	5	Compact Fluorescent: CFL - 2L - 26W	Wall Switch	52	2,795	Relamp	Yes	5	LED Screw-In Lamps: LED - 36W	High/Low Control	36	1,957	0.09	426	0.0	\$53.55	\$639.53	\$0.00	11.94

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Hallway 2 floor	5	Compact Fluorescent: CFL - 1L - 26W	Wall Switch	26	2,795	Relamp	No	5	LED Screw-In Lamps: LED - 18W	Wall Switch	18	2,795	0.03	125	0.0	\$15.75	\$219.77	\$0.00	13.95
Exterior	26	Metal Halide: (1) 200W Lamp	Daylight Dimming	232	4,380	Fixture Replacement	No	26	LED - Fixtures: Outdoor Post-Mount	Daylight Dimming	70	4,380	2.77	21,268	0.0	\$2,671.97	\$14,905.80	\$130.00	5.53
Exterior	18	High-Pressure Sodium: (1) 150W Lamp	Daylight Dimming	188	4,380	Fixture Replacement	No	18	LED - Fixtures: Outdoor Post-Mount	Daylight Dimming	56	4,380	1.55	11,932	0.0	\$1,499.00	\$10,319.40	\$90.00	6.82

Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Perth Amboy	Irrigation	1	Water Supply Pump	5.0	85.5%	No	2,745	No	85.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	DHW circulation	2	Heating Hot Water Pump	0.2	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	Water Booster Pumps	2	Water Supply Pump	3.0	85.5%	No	2,745	No	85.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	Heating System Pumps	2	Heating Hot Water Pump	40.0	93.0%	Yes	2,880	No	93.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHA101	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHB101-103	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHB104	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHC101	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHC102	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHC103	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHC104	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHC105	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHC106	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	CHC107	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-B101	1	Makeup Air Fan	0.2	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-B102	1	Makeup Air Fan	0.2	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-B103	1	Makeup Air Fan	0.0	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-B104	1	Makeup Air Fan	0.0	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-B105	1	Makeup Air Fan	0.2	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-B106	1	Makeup Air Fan	0.2	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

		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
Perth Amboy	UH-C101	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-C102	1	Makeup Air Fan	0.1	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-C103	1	Makeup Air Fan	0.0	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-C104	1	Makeup Air Fan	0.0	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	UH-C105	1	Makeup Air Fan	0.0	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	Combined Exhaust Fans	1	Exhaust Fan	43.3	65.0%	No	4,067	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	MAU-1	1	Makeup Air Fan	7.5	89.5%	No	8,760	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	MAU-2	1	Makeup Air Fan	7.5	89.5%	No	8,760	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	MAU-3	1	Makeup Air Fan	7.5	89.5%	No	8,760	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	MAU-4	1	Makeup Air Fan	7.5	89.5%	No	8,760	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	FH 1 - 4	4	Makeup Air Fan	0.5	65.0%	No	8,760	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	HRU-1	1	Supply Fan	3.0	89.5%	No	2,745	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	HRU-2	1	Supply Fan	3.0	89.5%	No	2,745	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	HRU-1	1	Exhaust Fan	2.0	88.5%	No	2,745	No	88.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	HRU-2	1	Exhaust Fan	2.0	88.5%	No	2,745	No	88.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth Amboy	DHW circulation	1	Heating Hot Water Pump	0.5	65.0%	No	2,745	No	65.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-A101	1	Supply Fan	7.5	91.7%	Yes	3,391	No	91.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-A102	1	Supply Fan	7.5	91.7%	Yes	3,391	No	91.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-A103	1	Supply Fan	7.5	91.7%	Yes	3,391	No	91.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-A201	1	Supply Fan	25.0	93.6%	Yes	4,067	No	93.6%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Rooftop	RTU-B101	1	Supply Fan	25.0	93.6%	Yes	4,067	No	93.6%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-B102	1	Supply Fan	10.0	91.7%	Yes	3,391	No	91.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-B103	1	Supply Fan	3.0	89.5%	Yes	2,745	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-B104	1	Supply Fan	3.0	89.5%	Yes	2,745	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-B105	1	Supply Fan	7.5	91.7%	Yes	3,391	No	91.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-B106	1	Supply Fan	3.0	89.5%	Yes	2,745	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-B107	1	Supply Fan	25.0	93.6%	Yes	4,067	No	93.6%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-B201	1	Supply Fan	15.0	92.4%	Yes	3,391	No	92.4%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-C101	1	Supply Fan	15.0	92.4%	Yes	3,391	No	92.4%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-C102	1	Supply Fan	15.0	92.4%	Yes	3,391	No	92.4%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-C103	1	Supply Fan	15.0	92.4%	Yes	3,391	No	92.4%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-C201	1	Supply Fan	15.0	92.4%	Yes	3,391	No	92.4%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	RTU-C202	1	Supply Fan	15.0	92.4%	Yes	3,391	No	92.4%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

Electric HVAC Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions		Proposed Conditions										Energy Impact & Financial Analysis						
		System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Rooftop	RTU-A101	1	Packaged AC	20.67		Yes	1	Packaged AC	20.67		12.70		No	1.89	2,865	0.0	\$359.96	\$34,872.91	\$1,632.67	92.34
Rooftop	RTU-A102	1	Packaged AC	20.67		Yes	1	Packaged AC	20.67		12.70		No	1.89	2,865	0.0	\$359.96	\$34,872.91	\$1,632.67	92.34
Rooftop	RTU-A103	1	Packaged AC	20.67		Yes	1	Packaged AC	20.67		12.70		No	1.89	2,865	0.0	\$359.96	\$34,872.91	\$1,632.67	92.34
Rooftop	RTU-A201	1	Packaged AC	65.00		Yes	1	Packaged AC	65.00		12.10		No	4.32	6,562	0.0	\$824.36	\$144,038.16	\$0.00	174.73
Rooftop	RTU-B101	1	Packaged AC	64.17		Yes	1	Packaged AC	64.17		12.10		No	4.26	6,478	0.0	\$813.79	\$142,191.52	\$0.00	174.73
Rooftop	RTU-B102	1	Packaged AC	24.63		Yes	1	Packaged AC	24.63		12.70		No	7.71	11,707	0.0	\$1,470.74	\$41,566.26	\$1,946.03	26.94
Rooftop	RTU-B103	1	Packaged AC	8.55		Yes	1	Packaged AC	8.55		14.00		No	1.45	2,210	0.0	\$277.68	\$15,237.00	\$624.15	52.62
Rooftop	RTU-B104	1	Packaged AC	8.55		Yes	1	Packaged AC	8.55		14.00		No	1.45	2,210	0.0	\$277.68	\$15,237.00	\$624.15	52.62
Rooftop	RTU-B105	1	Packaged AC	8.55		Yes	1	Packaged AC	8.55		14.00		No	1.45	2,210	0.0	\$277.68	\$15,237.00	\$624.15	52.62
Rooftop	RTU-B106	1	Packaged AC	19.83		Yes	1	Packaged AC	19.83		12.70		No	5.99	9,094	0.0	\$1,142.52	\$27,644.69	\$1,566.83	22.82
Rooftop	RTU-B107	1	Packaged AC	6.58		Yes	1	Packaged AC	6.58		14.00		No	1.03	1,565	0.0	\$196.55	\$11,717.34	\$479.98	57.17
Rooftop	RTU-B201	1	Packaged AC	64.17		Yes	1	Packaged AC	64.17		12.10		No	4.26	6,478	0.0	\$813.79	\$142,191.52	\$0.00	174.73
Rooftop	RTU-C101	1	Packaged AC	43.33		Yes	1	Packaged AC	43.33		12.20		No	3.12	4,733	0.0	\$594.62	\$96,025.44	\$0.00	161.49
Rooftop	RTU-C102	1	Packaged AC	43.92		Yes	1	Packaged AC	43.92		12.20		No	3.16	4,797	0.0	\$602.62	\$97,318.09	\$0.00	161.49
Rooftop	RTU-C103	1	Packaged AC	43.92		Yes	1	Packaged AC	43.92		12.20		No	3.16	4,797	0.0	\$602.62	\$97,318.09	\$0.00	161.49
Rooftop	RTU-C201	1	Packaged AC	43.92		Yes	1	Packaged AC	43.92		12.20		No	3.16	4,797	0.0	\$602.62	\$97,318.09	\$0.00	161.49
Rooftop	RTU-C202	1	Packaged AC	43.92		Yes	1	Packaged AC	43.92		12.20		No	3.16	4,797	0.0	\$602.62	\$97,318.09	\$0.00	161.49
Perth	HRU-1	1	Packaged AC	15.00		Yes	1	Packaged AC	15.00		13.90		No	3.38	5,141	0.0	\$645.85	\$20,907.75	\$1,185.00	30.54
Perth	HRU-2	1	Packaged AC	15.00		Yes	1	Packaged AC	15.00		13.90		No	3.38	5,141	0.0	\$645.85	\$20,907.75	\$1,185.00	30.54
Perth	MAU-1 to 4	4	Packaged Terminal AC	23.94		Yes	4	Packaged Terminal AC	23.94		12.70		No	16.37	24,869	0.0	\$3,124.36	\$183,374.97	\$6,224.83	56.70

		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
Perth	EWH-1	1	Electric Forced Air Furnace		6.82	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth	EWH-2	1	Electric Forced Air Furnace		2.56	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth	EWH-3	1	Electric Forced Air Furnace		3.41	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth	EWH-4	1	Electric Forced Air Furnace		2.56	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	
Perth Amboy	Building	4	Condensing Hot Water Boiler	2,000.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
Perth Amboy	RTU-B102	1	Furnace	292.00	Yes	1	Furnace	292.00	95.00%	AFUE	0.00	0	24.4	\$216.43	\$6,615.94	\$400.00	28.72	
Perth Amboy	RTU-B103	1	Furnace	147.00	Yes	1	Furnace	147.00	95.00%	AFUE	0.00	0	11.7	\$103.88	\$3,330.63	\$400.00	28.21	
Perth Amboy	RTU-B104	1	Furnace	147.00	Yes	1	Furnace	147.00	95.00%	AFUE	0.00	0	11.7	\$103.88	\$3,330.63	\$400.00	28.21	
Perth Amboy	RTU-B105	1	Furnace	147.00	Yes	1	Furnace	147.00	95.00%	AFUE	0.00	0	11.7	\$103.88	\$3,330.63	\$400.00	28.21	
Perth Amboy	RTU-B106	1	Furnace	223.00	Yes	1	Furnace	223.00	95.00%	AFUE	0.00	0	18.7	\$165.57	\$5,052.59	\$400.00	28.10	
Perth Amboy	RTU-B107	1	Furnace	93.20	Yes	1	Furnace	93.20	95.00%	AFUE	0.00	0	7.8	\$69.47	\$2,111.66	\$400.00	24.64	
Perth Amboy	MUA 1 - 4	4	Furnace	300.00	Yes	4	Furnace	300.00	95.00%	AFUE	0.00	0	156.3	\$1,385.12	\$27,188.80	\$1,600.00	18.47	

DHW Inventory & Recommendations

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

Commercial Refrigerator/Freezer Inventory & Recommendations

Location	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis							
	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years	
Perth Amboy	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
Perth Amboy	2	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	

Cooking Equipment Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Equipment Type		High Efficiency Equipment?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Perth	2	Insulated Food Holding Cabinet (1/2 Size)		No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth	1	Electric Convection Oven (Half Size)		No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Perth	1	Electric Fryer		No	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

Plug Load Inventory

Existing Conditions				
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Perth Amboy	22	Projector	200.0	No
Perth Amboy	215	Desktop and LCD Monitor	191.0	No
Perth Amboy	61	Printer	20.0	No
Perth Amboy	69	Microwave	300.0	No
Perth Amboy	20	Television LCD 75"	200.0	No
Perth Amboy	3	Mini Fridge	6.9	No
Perth Amboy	3	Copier	515.0	No
Perth Amboy	5	Refrigerator	12.5	No
Perth Amboy	1	3D Printer	40.0	No
Perth Amboy	1	TV Tube	320.0	No
Perth Amboy	1	Shop Equipment	30,000.0	No
Perth Amboy	1	Lab Equipment	10,000.0	No

Vending Machine Inventory & Recommendations

Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis							
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Perth	3	Refrigerated	Yes	0.00	4,836	0.0	\$607.50	\$690.00	\$0.00	1.14
Perth	1	Non-Refrigerated	Yes	0.00	343	0.0	\$43.03	\$230.00	\$0.00	5.34

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR®
Score¹

Perth Amboy Campus

Primary Property Type: K-12 School
Gross Floor Area (ft²): 150,000
Built: 2004

For Year Ending: April 30, 2017
Date Generated: March 28, 2018

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Perth Amboy Campus 457 High Street Perth Amboy, New Jersey 08861	Middlesex County Vocational School District 1011 Route 22 West Suite 203 Bridgewater, NC 08807 () -	Karl Knehr 1011 Route 22 West Suite 203 Bridgewater, NC 08807 732-257-3300 x1952 knehrk@mail.mcvts.net
Property ID: 6260843		

Energy Consumption and Energy Use Intensity (EUI)

Site EUI	Annual Energy by Fuel	National Median Comparison
103.6 kBtu/ft ²	Electric - Grid (kBtu) 7,932,931 (51%) Natural Gas (kBtu) 7,600,210 (49%)	National Median Site EUI (kBtu/ft ²) 78.3 National Median Source EUI (kBtu/ft ²) 165.9 % Diff from National Median Source EUI 32%
Source EUI 219.3 kBtu/ft ²		Annual Emissions Greenhouse Gas Emissions (Metric Tons CO ₂ e/year) 1,284

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

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Professional Engineer Stamp
(if applicable)