Local Government Energy Audit:
Energy Audit Report

Community Center

Woodbridge Township

600 Main Street
Woodbridge, New Jersey 07095

November 5, 2018

Final Report by:

TRC Energy Services

Disclaimer

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

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

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

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

Table of Contents

Table of Figures

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for the Woodbridge Community Center.

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.

1.1 Facility Summary

The Woodbridge Community Center is an approximately 167,978 square foot facility constructed in 2003. It is an impressive family entertainment and sports membership center. The Woodbridge Community Center boasts a spacious roller skating rink; an NHL size ice skating rink; a 25-yard, 6-lane swimming pool; a full court gymnasium; a fitness room; and an indoor walking/running track. Roller and ice skating lessons are available. The Woodbridge Community Center is also home to outdoor attractions, including an 18-hole Skyline Mini Golf course and batting cages. The Woodbridge Community Center also has a Café that offers many healthy and kid-friendly selections. The building is open to the public every day, year-round.

The building is constructed of concrete brick, and structural steel with a brick facade. It has a flat roof covered with a black roofing membrane that is in good condition. The windows throughout the facility are glass with aluminum frames and the exterior doors are constructed of metal and glass with aluminum frames.

Interior lighting consists mainly of linear fluorescent T8 fixtures with electronic ballasts as well as some compact fluorescent lamps (CFL) and high output T5 lamps. Lighting is controlled by manual switches. The building's exterior illumination is provided by a combination of LED, metal halide and CFL lamps that are controlled with timers and photocells.

Cooling and heating are provided by rooftop packaged units (RTUs). One 110 ton water cooled chiller is used to produce ice for the skating area while one Lochinvar boiler provides hot water to the indoor pool. Air is exhausted from restrooms and other common areas through the roof mounted exhausters.

The facility has PV arrays installed on the roof with 450 kW PV of generation capability.

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

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 14 measures. Thirteen measures were recommended for implementation which together represent an opportunity for the Woodbridge Community Center to reduce annual energy costs by roughly $112,667 and annual greenhouse gas emissions by 1,064,838 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in roughly 2.4 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce the Woodbridge Community Center's annual energy use by 16%.

Figure 1 – Previous 12 Month Utility Costs

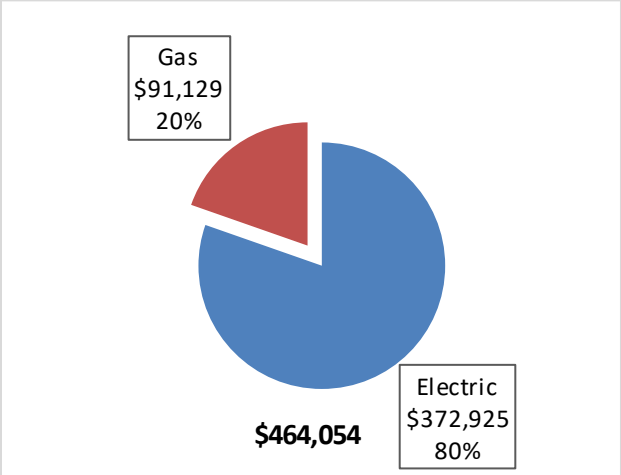
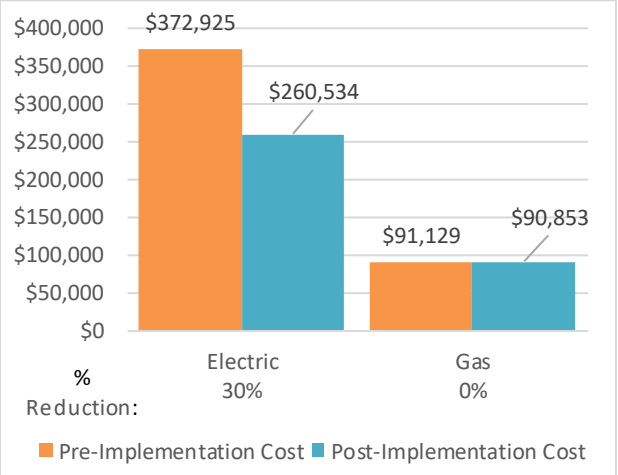


Figure 2 – Potential Post-Implementation Costs



A detailed description of Community Center's existing energy use can be found in Section 3.

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

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Natural Gas Savings (MMBtu)	Annual N/A Savings (MMBtu)	Annual N/A Savings (MMBtu)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**711,447**	**81.9**	**0.0**	**0.0**	**0.0**	**0.0**	**$75,870.89**	**$109,582.05**	**$16,830.00**	**$92,752.05**	**1.2**	**716,421**
ECM 1	Install LED Fixtures	Yes	442,736	53.0	0.0	0.0	0.0	0.0	$47,214.72	$66,661.11	$7,505.00	$59,156.11	1.3	445,832
ECM 2	Retrofit Fixtures with LED Lamps	Yes	268,711	28.9	0.0	0.0	0.0	0.0	$28,656.16	$42,920.94	$9,325.00	$33,595.94	1.2	270,590
Lighting Control Measures			**66,036**	**7.0**	**0.0**	**0.0**	**0.0**	**0.0**	**$7,042.25**	**$23,046.00**	**$3,290.00**	**$19,756.00**	**2.8**	**66,497**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	52,338	5.6	0.0	0.0	0.0	0.0	$5,581.44	$20,646.00	$3,290.00	$17,356.00	3.1	52,704
ECM 4	Install High/Low Lighitng Controls	Yes	13,698	1.5	0.0	0.0	0.0	0.0	$1,460.81	$2,400.00	$0.00	$2,400.00	1.6	13,794
Motor Upgrades			**44,675**	**6.7**	**0.0**	**0.0**	**0.0**	**0.0**	**$4,764.23**	**$26,653.82**	**$0.00**	**$26,653.82**	**5.6**	**44,987**
ECM 5	Premium Efficiency Motors	Yes	44,675	6.7	0.0	0.0	0.0	0.0	$4,764.23	$26,653.82	$0.00	$26,653.82	5.6	44,987
Variable Frequency Drive (VFD) Measures			**120,503**	**11.0**	**0.0**	**0.0**	**0.0**	**0.0**	**$12,850.80**	**$37,847.35**	**$4,800.00**	**$33,047.35**	**2.6**	**121,345**
ECM 6	Install VFDs on Constant Volume (CV) HVAC	Yes	13,255	3.3	0.0	0.0	0.0	0.0	$1,413.56	$10,820.40	$1,800.00	$9,020.40	6.4	13,348
ECM 7	Install VFDs on Chilled Water Pumps	Yes	75,201	6.4	0.0	0.0	0.0	0.0	$8,019.69	$16,005.40	$3,000.00	$13,005.40	1.6	75,727
ECM 8	Install VFDs on Hot Water Pumps	Yes	13,115	1.3	0.0	0.0	0.0	0.0	$1,398.60	$3,807.95	$0.00	$3,807.95	2.7	13,206
ECM 9	Install VFDs on Cooling Tower Fans	Yes	18,932	0.0	0.0	0.0	0.0	0.0	$2,018.95	$7,213.60	$0.00	$7,213.60	3.6	19,064
Electric Chiller Replacement			**92,252**	**14.2**	**0.0**	**0.0**	**0.0**	**0.0**	**$9,838.05**	**$95,494.23**	**$4,730.00**	**$90,764.23**	**9.2**	**92,897**
ECM 10	Install High Efficiency Chillers	Yes	92,252	14.2	0.0	0.0	0.0	0.0	$9,838.05	$95,494.23	$4,730.00	$90,764.23	9.2	92,897
Domestic Water Heating Upgrade			**0**	**0.0**	**30.5**	**0.0**	**0.0**	**30.5**	**$275.38**	**$401.52**	**$0.00**	**$401.52**	**1.5**	**3,567**
ECM 11	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	30.5	0.0	0.0	30.5	$275.38	$401.52	$0.00	$401.52	1.5	3,567
Food Service Equipment & Refrigeration Measures			**6,055**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**$645.70**	**$4,385.21**	**$250.00**	**$4,135.21**	**6.4**	**6,097**
ECM 12	Refrigeration Controls	Yes	6,055	0.2	0.0	0.0	0.0	0.0	$645.70	$4,385.21	$250.00	$4,135.21	6.4	6,097
Plug Load Equipment Control - Vending Machine			**12,935**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**$1,379.43**	**$3,450.00**	**$0.00**	**$3,450.00**	**2.5**	**13,025**
ECM 13	Vending Machine Control	Yes	12,935	0.0	0.0	0.0	0.0	0.0	$1,379.43	$3,450.00	$0.00	$3,450.00	2.5	13,025
Custom Measures			**11,406**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**$1,163.40**	**$50,000.00**	**$0.00**	**$50,000.00**	**43.0**	**11,486**
	Pool Cover Measure	No	11,406	0.0	0.0	0.0	0.0	0.0	$1,163.40	$50,000.00	$0.00	$50,000.00	43.0	11,486
TOTALS FOR HIGH PRIORITY MEASURES			**1,053,902**	**121.0**	**30.5**	**0.0**	**0.0**	**30.5**	**$112,666.74**	**$300,860.17**	**$29,900.00**	**$270,960.17**	**2.4**	**1,064,838**
TOTALS FOR ALL EVALUATED MEASURES			**1,065,308**	**121.0**	**30.5**	**0.0**	**0.0**	**30.5**	**$113,830.14**	**$350,860.17**	**$29,900.00**	**$320,960.17**	**2.8**	**1,076,323**

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

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

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

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

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

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

Electric Chiller measures generally involve replacing older inefficient hydronic chillers with modern energy efficient systems. New chillers can provide equivalent cooling compared to older chillers at a reduced energy cost. These measures save energy by reducing chiller energy usage, due to improved electrical and heat transfer efficiency.

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

Food Service Equipment & Refrigeration measures generally involve improvements in the efficiency of cooking, food service, dishwashing, and food storage equipment. These measures may include more efficient convection ovens, steamers, ice machines, or refrigeration. These measures save energy by reducing the energy usage with more energy efficient equipment.

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

Energy Efficient Practices

TRC also identified 17 low cost (or no cost) energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at the Woodbridge Community Center include:

- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Turn Off Unneeded Motors
- Reduce Motor Short Cycling
- Perform Routine Motor Maintenance
- Use Fans to Reduce Cooling Load

- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Ensure Economizers are Functioning Properly
- Assess Chillers & Request Tune-Ups
- 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
- Perform Maintenance on Compressed Air Systems
- Install Plug Load Controls
- Water Conservation

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

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation for the Woodbridge Community Center. Based on the configuration of the site and its loads there is a low potential for installing any additional PV and combined heat and power self-generation measures.

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

1.3 Implementation Planning

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

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

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

- SmartStart
- Pay for Performance - Existing Buildings (P4P EB)
- 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.

Larger facilities with an interest in a more comprehensive whole building approach to energy conservation should consider participating in the Pay for Performance (P4P) program. Projects eligible for this project program must meet minimum savings requirements. Final incentives are calculated based on actual measured performance achieved at the end of the project. The application process is more involved, and it requires working with a qualified P4P contractor, but the process may result in greater energy savings overall and more lucrative incentives, up to 50% of project's total cost.

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

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce electric loads at commercial facilities, when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

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

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 4 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Brian B. Burke	Building Superintendent	brian.burke@twp.woodbridge.nj.us	(732) 634-4500
Designated Representative			
Richie French	Maintenance Personnel		(732) 277-7826
TRC Energy Services			
Moussa Traore	Auditor	mtraore@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On August 31, 2016, TRC performed an energy audit at the Woodbridge Community Center located in Woodbridge, New Jersey. TRC's met with Richie French to review the facility operations and help focus our investigation on specific energy-using systems.

The Woodbridge Community Center is an approximately 167,978 square feet facility constructed in 2003. It is an impressive family entertainment and sports membership center. The Woodbridge Community Center boasts a spacious roller skating rink; an NHL size ice-skating rink; a 25-yard, six-lane swimming pool; a full court gymnasium; a fitness room; and an indoor walking/running track. Roller and ice skating lessons are available. The Woodbridge Community Center is also home to outdoor attractions, including an 18-hole Skyline Mini Golf course and a batting cages. The Center also has a Café that offers many healthy and kid-friendly selections. The building is open to the public every day, year-round.

Image 1: Indoor Pool

2.3 Building Occupancy

The building is open is open to the community every day, year round. The typical schedule is presented in the figure below. During a typical day, the facility is occupied by more than 600 people.

Figure 5 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Community Center	Weekday	6:00 AM - 12:00 AM
Community Center	Weekend	6:00 AM - 2:00 AM

2.4 Building Envelope

The foundation consists of cast-in-place concrete perimeter wall. Exterior walls are constructed of concrete brick and structural steel with a brick facade. The building has a flat roof covered with a black roofing membrane that is in good condition and houses 1,079 PV arrays. The building has windows with insulated panes set in aluminum frames located on the upper wall. The entrance doors are fully glazed aluminum framed doors. The emergency exit doors are commercial grade metal doors. No excessive air infiltration was noted around any windows or doors.

Image 2: Building Envelope

2.5 On-Site Generation

The Woodbridge Community Center installed a roof-mounted 450 kW DC photovoltaic energy generation system, operating exclusively as a Net Metering Photovoltaic Solar Electric Facility (SEF). The Solar Electric Facility is comprised of 83 strings each with 13 poly-crystalline silicon photovoltaic modules.

Based on the information provided for the PV system generation and the building utility bills, the PV system generates about 10% of the facilities' total annual electricity consumption.

Image 3: Roof Mounted PV Arrays

2.6 Energy-Using Systems

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

Lighting System

The building is primarily lit by linear fluorescent fixtures which contain 32-Watt T8 lamps. Fixtures throughout the building include pendant-mounted continuous rows fixtures, surface mounted wraps, recessed troffer fixtures and industrial type fixtures. Areas such as locker rooms, restrooms, lobby and hallways have recessed can fixtures with compact fluorescent plug in lamps. The gymnasium and the indoor pool are lit with metal halide lamps. Spaces such as fitness center, cafeteria, cardio room, learning center and the skating area are primarily lit with high output T5 lamps. Lighting is controlled mostly by manual wall switches.

The exterior lighting includes building mounted wall pack fixtures with 26-Watt CFL and 70-Watt metal halide lamps, ground mounted up-light LED fixtures, and parking lot pole-mounted 400-Watt metal halide lamps. The exterior lighting is controlled by a timeclock and photocells.

Image 4: Typical Indoor Lights

Image 5: Typical Exterior Lights

Chilled Water or Condenser Water System

A 110 ton water cooled chiller located in Room 119A is used to freeze the rink surface. The maintenance team sets the refrigeration system's temperature based on indoor and outdoor temperature. To freeze the rink surface, the system pumps gallons of freezing brine water through the pipes and then onto the ice-bearing concrete slab. Two 25 hp constant speed chilled water pumps that run lead/lag are used. The chiller is made by Henry Technologies Industries. It is original to the facility and appears in fair condition.

The condenser water system consists of one cooling tower located in the rear of the building. The cooling tower has one 15 hp fan motor that runs at constant speed. The condenser water is circulated by one 7.5 hp constant speed pump.

Room 119A also houses one Zamboni that is powered by natural gas and requires hot water to perform its special grooming task. One 80 gallon storage tank hot water heater supplies hot water to clean and smooth the surface of the rink, and a snow melt tank to quickly melt Zamboni scrapped snow.

Image 6: Water Cooled Chiller

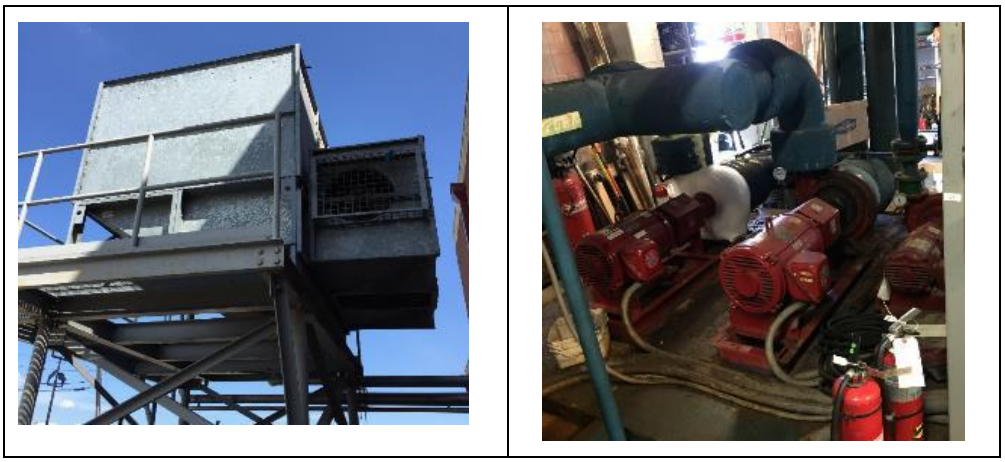


Image 7: Cooling Tower and Chilled Water Pumps

Hot Water Heating System

The hot water system consists of one four year old Lochinvar 881kBtu/hr output non-condensing hot water boiler dedicated to heat the pool water. The boiler is located in the pump room and has a combustion efficiency of 89%. Hot water is supplied to the pool via a 10 hp constant speed pump. It has an integrated operating control system that provides precise temperature control and diagnostic information. The boiler is well maintained and is in good condition.

Image 8: Pool Hot Water Boiler

Direct Expansion Air Conditioning System (DX)

The DX system consists of 16 roof top packaged units (RTUs) of various sizes, serving different areas of the building. They are all new (three years old) and appear in good condition. The units utilize scroll compressors and direct-expansion coils. The units are equipped with gas-fired sections for heating, and with outside air economizers. The indoor swimming pool is served by a highly efficient self-contained PoolPak energy recovery unit that is designed to simultaneously control humidity, space and water temperature. Refer to the table below for the observed condition of the units. The units are controlled by programmable thermostats.

System Type	Qty	Capacity (Ton)	Heating Capacity (MBH)	Areas Served	Manufacturer	Age (Year)	Current Condition
Packaged AC (Unit 1)	1	2	33	Maintenance Room	CARRIER	3	Good
Packaged (Unit 2)	1	5	120	Locker Rooms	CARRIER	3	Good
Packaged (Unit 3)	1	5	12	Cafeteria	CARRIER	3	Good
Packaged (Unit 4)	1	5	120	Billiards/Vito Room	CARRIER	3	Good
Packaged (Unit 5)	1	10	320	Rooms 213/214/215	CARRIER	3	Good
Packaged (Unit 6)	1	6	120	Skate Rental Room	CARRIER	3	Good
Packaged (Unit 7)	1	7.5	102	Wellness Center	CARRIER	3	Good
Packaged (Unit 8)	1	7.5	103	Learning Room	CARRIER	3	Good
Packaged (Unit 9)	1	8.5	103	Office/Weigh Room/Senior Center	CARRIER	3	Good
Packaged (Unit 10)	1	12.5	195	Administrative offices	CARRIER	3	Good
Packaged (Unit 11)	1	20	324	Lobby	CARRIER	3	Good
Packaged (Unit 12)	1	25	324	Gymnasium	CARRIER	3	Good
Packaged (Unit 13)	1	5	120	Locker Rooms-Pool	CARRIER	3	Good

Packaged (Unit 14)	1	30	480	Swimming Pool	PoolPak	3	Good
Packaged (Unit 15)	1	70	648	Roller Rink	AAON	3	Good
Packaged (Unit 16)	1	60	-	Ice Rink	Munters	3	Good

Image 9: Roof Top Units

Image 10: Programmable Thermostats

Outdoor Waterfall Pumps

There a several pumps serving the outdoor pond fountain aerators located at the rear of the building in the small garden near the batting cages and the picnic areas. They are sized from 0.3 hp to 2 hp. They run continuously when the facility is open.

Image 11: Outdoor Garden

Image 12: Outdoor Pond Fountains and Pumps

Domestic Hot Water Heating System

The building is supplied domestic hot water by three State Industries non-condensing, gas-fired storage tank water heaters. Two 80 gallon water heaters with an input rating of 725 kBtu/hr each and a nominal efficiency of 80% serve the restrooms and the ice rink snow melting tank. A 0.1 hp recirculation pump supplies 140°F water to the ice melting tank. The heaters are located in pump room and appear in good condition.

The cafeteria and locker rooms are served by a 100 gallon storage tank water heater with an input rating of 200 kBtu/hr and a nominal efficiency of 80%. The heater is located in the storage room and appear in good condition.

When planning replacement of these standard efficiency water heaters, the Woodbridge Community Center should opt for condensing water heaters which are more than 90% efficient, reducing the facility natural gas usage.

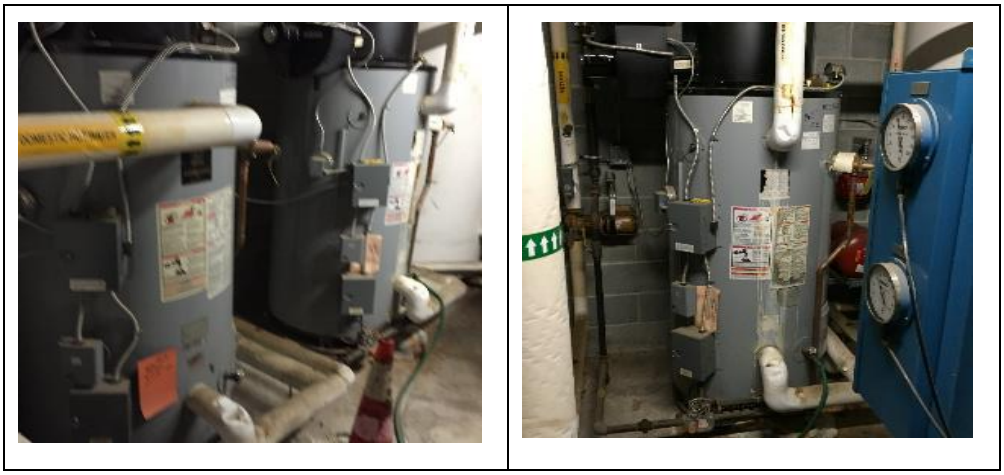


Image 13: Domestic Hot Water Systems

Food Service & Refrigeration

The Woodbridge Community Center has a commercial cafeteria that is used to prepare food for the visitors and employees. The cafeteria equipment is mostly gas-fired type including ovens, convection ovens and fryers. The cafeteria is open until late afternoon.

The cafeteria also includes two walk-in units, one standup refrigerator and freezer, and one ice making machine.

Image 14: Cafeteria Cooking equipment & Walk in Units

Building Plug Load

There are 35 computer work stations throughout the facility. The computers are desktop units with LCD monitors. There is no centralized PC power management software installed. Other plug loads in the building consist of copy machines, printers, microwaves, flat screen TVs, small refrigerators, coffee machine and various types of fitness equipment. There are 15 vending machines located in various interior and exterior spaces. Nine of these machines are refrigerated vending machines and six are non-refrigerated vending machines.

2.7 Water-Using Systems

There are several restrooms at this facility. A sampling of restrooms found that some faucets are rated for 2.2 gallons per minute (gpm) or higher, the toilets are rated at 2.5 gallons per flush (gpf) and the urinals are rated at 2 gpf. There are locker rooms with showers that have faucets rated as low flow. The cafeteria has three faucets that are rated for 2.5 gpm or higher.

3 SITE ENERGY USE AND COSTS

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

3.1 Total Cost of Energy

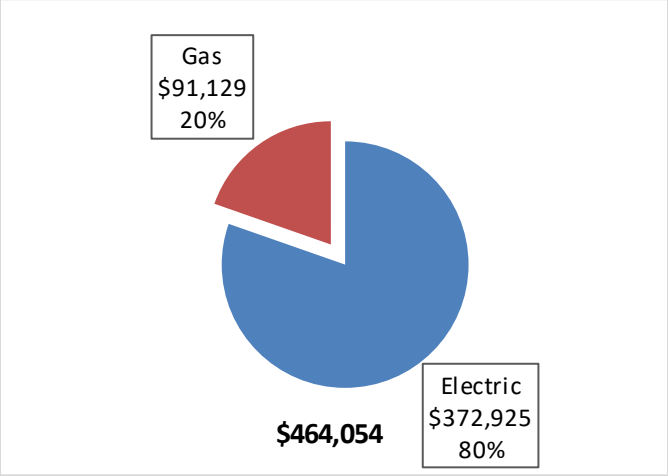
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 6 - Utility Summary

Utility Summary for Community Center		
Fuel	**Usage**	**Cost**
Electricity	3,496,949 kWh	$372,925
Natural Gas	100,802 Therms	$91,129
Total		**$464,054**

The current annual energy cost for this facility is $464,054 as shown in the chart below.

Figure 7 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by PSE&G and by on-site solar production. The average electric cost over the past 12 months was $0.107/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. Electric usage profile is fairly constant throughout the year. This confirms the 12 months of facility operation.

Figure 8 - Electric Usage & Demand

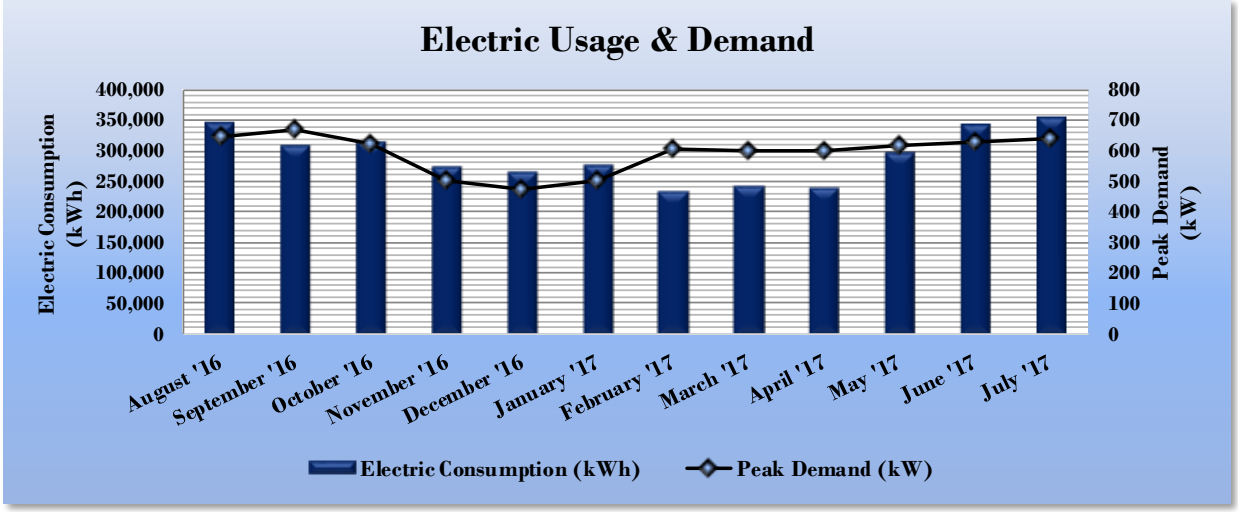


Figure 9 - Electric Usage & Demand

Electric Billing Data for Community Center					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Total Electric Cost	TRC Estimated Usage?
8/31/16	31	345,027	648	$34,148	No
9/30/16	30	309,747	671	$30,516	No
10/31/16	31	313,151	622	$43,873	No
11/30/16	30	273,075	501	$37,023	No
12/31/16	31	265,466	475	$23,341	No
1/31/17	31	277,402	500	$24,384	No
2/27/17	28	233,648	607	$28,847	No
3/30/17	31	243,830	600	$36,032	No
4/30/17	30	240,174	600	$19,400	No
5/31/17	31	297,816	620	$23,258	No
6/30/17	30	342,119	631	$33,937	No
7/31/17	31	355,494	642	$38,166	No
Totals	**365**	**3,496,949**	**671.4**	**$372,925**	0
Annual	**365**	**3,496,949**	**671.4**	**$372,925**	

3.3 Natural Gas Usage

Natural gas is provided by Elizabethtown Gas. The average gas cost for the past 12 months is $0.904/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 10 - Natural Gas Usage

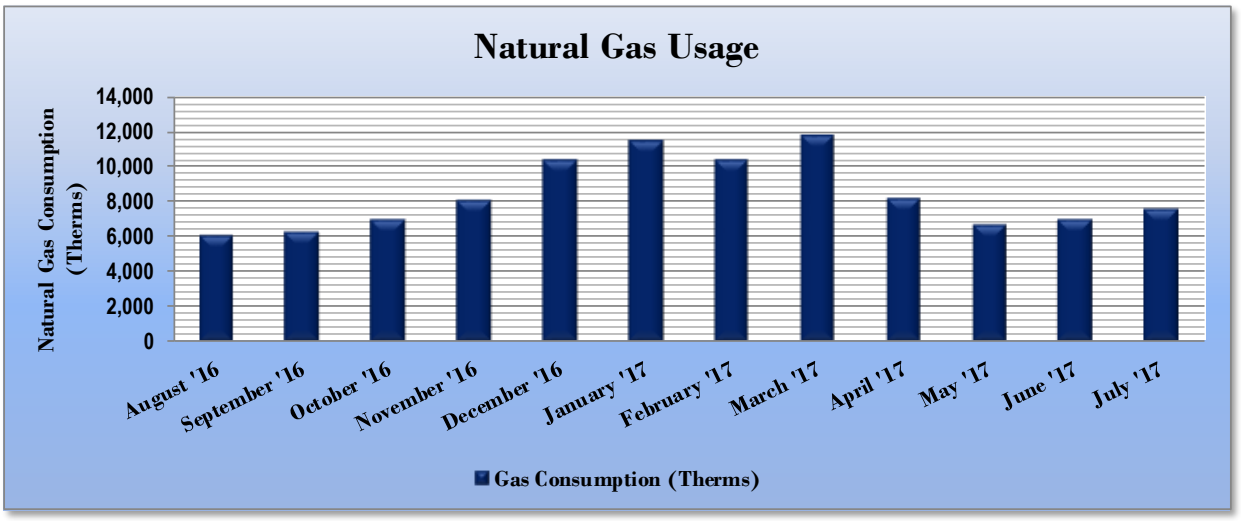


Figure 11 - Natural Gas Usage

Gas Billing Data for Community Center			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
8/25/16	31	6,024	$5,077
9/26/16	30	6,235	$5,596
10/25/16	31	6,981	$6,141
11/23/16	30	8,043	$6,922
12/22/16	31	10,432	$8,752
1/24/17	31	11,484	$9,594
2/22/17	28	10,351	$8,717
3/23/17	31	11,820	$9,838
4/24/17	30	8,146	$7,028
5/24/17	31	6,706	$5,927
6/23/17	30	7,004	$8,565
7/25/17	31	7,577	$8,972
Totals	**365**	**100,802**	**$91,129**
Annual	**365**	**100,802**	**$91,129**

3.4 Benchmarking

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

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

Figure 12 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Community Center	National Median Building Type: Rec./Entertainment/Parks
Source Energy Use Intensity (kBtu/ft^2)	286.0	96.8
Site Energy Use Intensity (kBtu/ft^2)	131.0	41.2

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

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

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Community Center	National Median Building Type: Rec./Entertainment/Parks
Source Energy Use Intensity (kBtu/ft^2)	218.6	96.8
Site Energy Use Intensity (kBtu/ft^2)	109.5	41.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75% of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This building is not eligible to receive a score because the property type falls under Fitness Center/Health Club/Gym type, which is currently not being rated by ENERGY STAR® score.

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

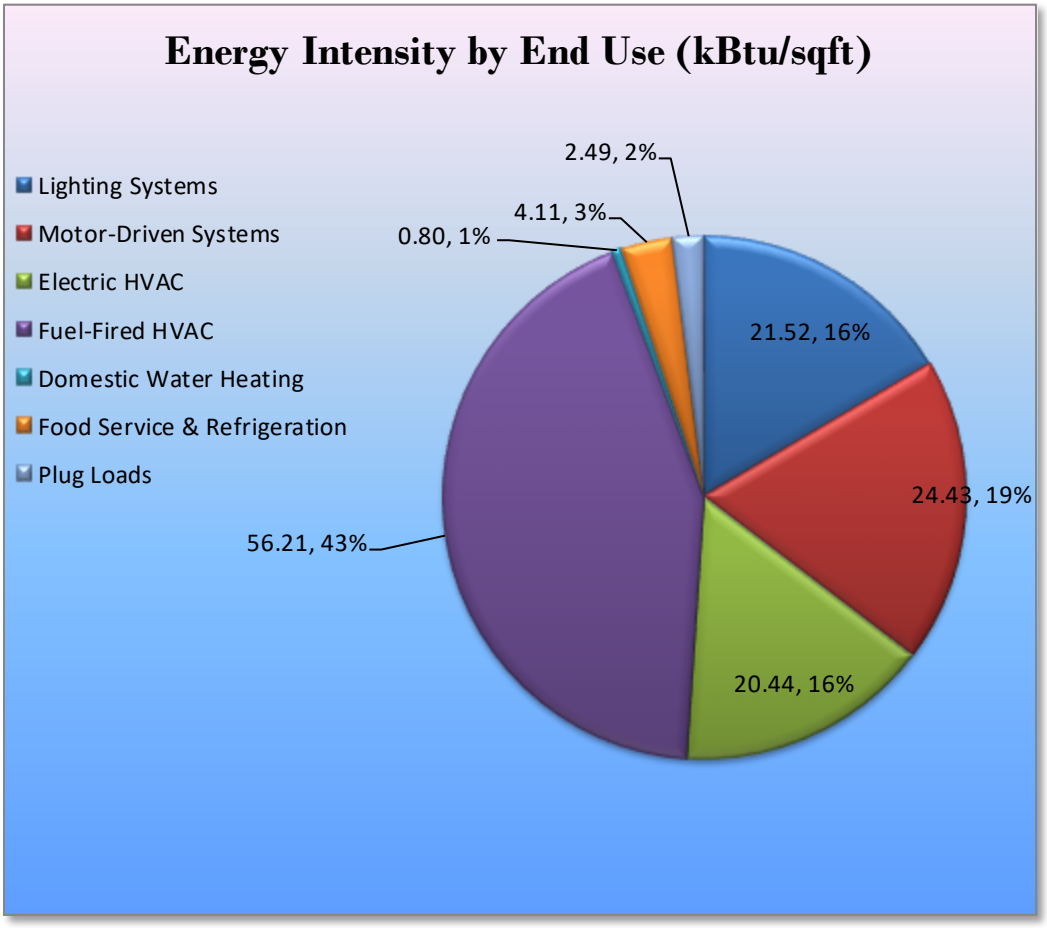
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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

3.5 Energy End-Use Breakdown

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

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



4 ENERGY CONSERVATION MEASURES

Level of Analysis

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

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 15 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**711,447**	**81.9**	**0.0**	**$75,870.89**	**$109,582.05**	**$16,830.00**	**$92,752.05**	**1.2**	**716,421**
ECM 1	Install LED Fixtures	442,736	53.0	0.0	$47,214.72	$66,661.11	$7,505.00	$59,156.11	1.3	445,832
ECM 2	Retrofit Fixtures with LED Lamps	268,711	28.9	0.0	$28,656.16	$42,920.94	$9,325.00	$33,595.94	1.2	270,590
Lighting Control Measures		**66,036**	**7.0**	**0.0**	**$7,042.25**	**$23,046.00**	**$3,290.00**	**$19,756.00**	**2.8**	**66,497**
ECM 3	Install Occupancy Sensor Lighting Controls	52,338	5.6	0.0	$5,581.44	$20,646.00	$3,290.00	$17,356.00	3.1	52,704
ECM 4	Install High/Low Lighitng Controls	13,698	1.5	0.0	$1,460.81	$2,400.00	$0.00	$2,400.00	1.6	13,794
Motor Upgrades		**44,675**	**6.7**	**0.0**	**$4,764.23**	**$26,653.82**	**$0.00**	**$26,653.82**	**5.6**	**44,987**
ECM 5	Premium Efficiency Motors	44,675	6.7	0.0	$4,764.23	$26,653.82	$0.00	$26,653.82	5.6	44,987
Variable Frequency Drive (VFD) Measures		**120,503**	**11.0**	**0.0**	**$12,850.80**	**$37,847.35**	**$4,800.00**	**$33,047.35**	**2.6**	**121,345**
ECM 6	Install VFDs on Constant Volume (CV) HVAC	13,255	3.3	0.0	$1,413.56	$10,820.40	$1,800.00	$9,020.40	6.4	13,348
ECM 7	Install VFDs on Chilled Water Pumps	75,201	6.4	0.0	$8,019.69	$16,005.40	$3,000.00	$13,005.40	1.6	75,727
ECM 8	Install VFDs on Hot Water Pumps	13,115	1.3	0.0	$1,398.60	$3,807.95	$0.00	$3,807.95	2.7	13,206
ECM 9	Install VFDs on Cooling Tower Fans	18,932	0.0	0.0	$2,018.95	$7,213.60	$0.00	$7,213.60	3.6	19,064
Electric Chiller Replacement		**92,252**	**14.2**	**0.0**	**$9,838.05**	**$95,494.23**	**$4,730.00**	**$90,764.23**	**9.2**	**92,897**
ECM 10	Install High Efficiency Chillers	92,252	14.2	0.0	$9,838.05	$95,494.23	$4,730.00	$90,764.23	9.2	92,897
Domestic Water Heating Upgrade		**0**	**0.0**	**30.5**	**$275.38**	**$401.52**	**$0.00**	**$401.52**	**1.5**	**3,567**
ECM 11	Install Low-Flow Domestic Hot Water Devices	0	0.0	30.5	$275.38	$401.52	$0.00	$401.52	1.5	3,567
Food Service Equipment & Refrigeration Measures		**6,055**	**0.2**	**0.0**	**$645.70**	**$4,385.21**	**$250.00**	**$4,135.21**	**6.4**	**6,097**
ECM 12	Refrigeration Controls	6,055	0.2	0.0	$645.70	$4,385.21	$250.00	$4,135.21	6.4	6,097
Plug Load Equipment Control - Vending Machine		**12,935**	**0.0**	**0.0**	**$1,379.43**	**$3,450.00**	**$0.00**	**$3,450.00**	**2.5**	**13,025**
ECM 13	Vending Machine Control	12,935	0.0	0.0	$1,379.43	$3,450.00	$0.00	$3,450.00	2.5	13,025
TOTALS		**1,053,902**	**121.0**	**30.5**	**$112,666.74**	**$300,860.17**	**$29,900.00**	**$270,960.17**	**2.4**	**1,064,838**

* - 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 16 below.

Figure 16 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**711,447**	**81.9**	**0.0**	**$75,870.89**	**$109,582.05**	**$16,830.00**	**$92,752.05**	**1.2**	**716,421**
ECM 1	Install LED Fixtures	442,736	53.0	0.0	$47,214.72	$66,661.11	$7,505.00	$59,156.11	1.3	445,832
ECM 2	Retrofit Fixtures with LED Lamps	268,711	28.9	0.0	$28,656.16	$42,920.94	$9,325.00	$33,595.94	1.2	270,590

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

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	342,259	36.5	0.0	$36,499.53	$9,257.70	$305.00	$8,952.70	0.2	344,652
Exterior	100,477	16.5	0.0	$10,715.20	$57,403.41	$7,200.00	$50,203.41	4.7	101,180

Measure Description

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

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_2e Emissions Reduction (lbs)
Interior	267,800	28.8	0.0	$28,559.01	$42,142.54	$9,325.00	$32,817.54	1.1	269,672
Exterior	911	0.1	0.0	$97.16	$778.40	$0.00	$778.40	8.0	917

Measure Description

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

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

4.1.2 Lighting Control Measures

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

Figure 17 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**66,036**	**7.0**	**0.0**	**$7,042.25**	**$23,046.00**	**$3,290.00**	**$19,756.00**	**2.8**	**66,497**
ECM 3	Install Occupancy Sensor Lighting Controls	52,338	5.6	0.0	$5,581.44	$20,646.00	$3,290.00	$17,356.00	3.1	52,704
ECM 4	Install High/Low Lighitng Controls	13,698	1.5	0.0	$1,460.81	$2,400.00	$0.00	$2,400.00	1.6	13,794

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_2e Emissions Reduction (lbs)
52,338	5.6	0.0	$5,581.44	$20,646.00	$3,290.00	$17,356.00	3.1	52,704

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in restrooms, offices, storage rooms, locker rooms, and meeting rooms. 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_2e Emissions Reduction (lbs)
13,698	1.5	0.0	$1,460.81	$2,400.00	$0.00	$2,400.00	1.6	13,794

Measure Description

We recommend installing occupancy sensors to provide dual level lighting control for lighting fixtures in hallways that are infrequently occupied but may require some level of continuous lighting for safety or security reasons.

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

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

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

4.1.3 Motor Upgrades

Our recommendation for upgrades to existing premium efficiency motors is summarized in Figure 18 below.

Figure 18 – Summary of Premium Efficiency Motor ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**44,675**	**6.7**	**0.0**	**$4,764.23**	**$26,653.82**	**$0.00**	**$26,653.82**	**5.6**	**44,987**
ECM 5	Premium Efficiency Motors	44,675	6.7	0.0	$4,764.23	$26,653.82	$0.00	$26,653.82	5.6	44,987

ECM 5: Premium Efficiency Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
44,675	6.7	0.0	$4,764.23	$26,653.82	$0.00	$26,653.82	5.6	44,987

Measure Description

We recommend replacing standard efficiency motors with NEMA Premium® efficiency motors in the following applications: two 25 hp chilled water pumps, one 7.5 condenser water pump, two 100 hp compressors, one 15 hp cooling tower motor, and three 7.5 building exhaust fans. Our evaluation assumes that existing motors will be replaced with motors of equivalent size and type. Although occasionally additional savings can be achieved by downsizing motors to better meet the motor's current load requirements. The base case motor efficiencies are estimated from nameplate information and our best estimates of motor run hours. Efficiencies of proposed motor upgrades are obtained from the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings (2016)*. Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours.

4.1.4 Variable Frequency Drive Measures

Our recommendations for variable frequency drive (VFD) measures are summarized in Figure 19 below.

Figure 19 – Summary of Variable Frequency Drive ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**120,503**	**11.0**	**0.0**	**$12,850.80**	**$37,847.35**	**$4,800.00**	**$33,047.35**	**2.6**	**121,345**
ECM 6	Install VFDs on Constant Volume (CV) HVAC	13,255	3.3	0.0	$1,413.56	$10,820.40	$1,800.00	$9,020.40	6.4	13,348
ECM 7	Install VFDs on Chilled Water Pumps	75,201	6.4	0.0	$8,019.69	$16,005.40	$3,000.00	$13,005.40	1.6	75,727
ECM 8	Install VFDs on Hot Water Pumps	13,115	1.3	0.0	$1,398.60	$3,807.95	$0.00	$3,807.95	2.7	13,206
ECM 9	Install VFDs on Cooling Tower Fans	18,932	0.0	0.0	$2,018.95	$7,213.60	$0.00	$7,213.60	3.6	19,064

ECM 6: Install VFDs on Constant Volume (CV) Exhaust Fans

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
13,255	3.3	0.0	$1,413.56	$10,820.40	$1,800.00	$9,020.40	6.4	13,348

Measure Description

We recommend installing variable frequency drives (VFDs) to control the fan speed of three roof mounted exhaust fan motors. Energy savings results from reducing fan speed (and power) when there is a reduced load required for the zone. The magnitude of energy savings is based on the estimated amount of time that fan motors operate at partial load.

ECM 7: Install VFDs on Chilled Water Pumps

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
75,201	6.4	0.0	$8,019.69	$16,005.40	$3,000.00	$13,005.40	1.6	75,727

Measure Description

We recommend installing variable frequency drives (VFD) to control the two 25 hp chilled water pumps. This measure requires that chilled water coils be served by 2-way valves and that a differential pressure sensor be installed in the chilled water loop. As the chilled water valves close, the differential pressure increases. The VFD modulates pump speed to maintain a differential pressure setpoint. Energy savings results from reducing pump motor speed (and power) as chilled water valves close. The magnitude of energy savings is based on the estimated amount of time that the system operates at reduced loads.

For systems with variable chilled water flow through the chiller, the minimum flow to prevent the chiller from tripping off will have to be determined during the final project design. The control system should be programmed to maintain the minimum flow through the chiller and to prevent pump cavitation.

ECM 8: Install VFDs on Hot Water Pumps

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
13,115	1.3	0.0	$1,398.60	$3,807.95	$0.00	$3,807.95	2.7	13,206

Measure Description

We recommend installing a variable frequency drive (VFD) to control the 10 hp hot water pump. This measure requires that a majority of the hot water coils be served by two-way valves and that a differential pressure sensor is installed in the hot water loop. As the hot water valves close, the differential pressure increases. The VFD modulates pump speed to maintain a differential pressure setpoint. Energy savings results from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

ECM 9: Install VFDs on Cooling Tower Fan

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
18,932	0.0	0.0	$2,018.95	$7,213.60	$0.00	$7,213.60	3.6	19,064

Measure Description

We recommend installing a variable frequency drive (VFD) to control the 15 hp cooling tower fan motor. The VFD will allow the cooling tower fan to operate at the minimum speed necessary to maintain the temperature of the condenser water returning to the chiller. Energy savings results from reducing fan speed (and power) when there is a reduced load on the chiller and outside air wet bulb temperatures are depressed. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

4.1.5 Electric Chiller Replacement

Our recommendation for electric chiller replacement measures is summarized in Figure 20 below.

Figure 20 – Summary of Electric Chiller ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Chiller Replacement		**92,252**	**14.2**	**0.0**	**$9,838.05**	**$95,494.23**	**$4,730.00**	**$90,764.23**	**9.2**	**92,897**
ECM 10	Install High Efficiency Chillers	92,252	14.2	0.0	$9,838.05	$95,494.23	$4,730.00	$90,764.23	9.2	92,897

ECM 10: Install High Efficiency Chillers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
92,252	14.2	0.0	$9,838.05	$95,494.23	$4,730.00	$90,764.23	9.2	92,897

Measure Description

We recommend replacing the older inefficient electric chiller with a new high efficiency chiller. The type of chiller to be installed depends on the magnitude of the cooling load and variability of the cooling load profile. Positive displacement chillers are usually under 600 tons of cooling capacity and centrifugal chillers generally start at 150 tons of cooling capacity. Constant speed chillers should be used to meet cooling loads with little or no variation while variable speed chillers are more efficient for variable cooling load profiles. Water cooled chillers are more efficient than air cooled chillers but require cooling towers and additional pumps to circulate the cooling water. In any given size range variable speed chillers tend to have better partial load efficiency, but worse full load efficiency, than constant speed chillers. Chiller selection should be optimized to provide cooling in the range required for the ice making application.

The savings result from the improvement in chiller efficiency and matching the right type of chiller to the cooling load. The energy savings associated with this measure is based on the cooling capacity of the new chiller, the improvement in efficiency compared with the base case equipment, the cooling load profile, and the estimated annual operating hours of the chiller before and after the upgrade. Energy savings are maximized by proper selection of new equipment based on the cooling load profile.

4.1.6 Domestic Hot Water Heating System Upgrades

Our recommendation for domestic water heating system improvements is summarized in Figure 21 below.

Figure 21 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**30.5**	**$275.38**	**$401.52**	**$0.00**	**$401.52**	**1.5**	**3,567**
ECM 11	Install Low-Flow Domestic Hot Water Devices	0	0.0	30.5	$275.38	$401.52	$0.00	$401.52	1.5	3,567

ECM 11: Install Low-Flow DHW Devices

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	30.5	$275.38	$401.52	$0.00	$401.52	1.5	3,567

Measure Description

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

4.1.7 Food Service Equipment & Refrigeration Measures

Our recommendation for food service equipment and refrigeration measures is summarized in Figure 22 below.

Figure 22 - Summary of Food Service Equipment & Refrigeration ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Food Service Equipment & Refrigeration Measures		**6,055**	**0.2**	**0.0**	**$645.70**	**$4,385.21**	**$250.00**	**$4,135.21**	**6.4**	**6,097**
ECM 12	Refrigeration Controls	6,055	0.2	0.0	$645.70	$4,385.21	$250.00	$4,135.21	6.4	6,097

ECM 12: Walk-In Cooler and Freezer Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
6,055	0.2	0.0	$645.70	$4,385.21	$250.00	$4,135.21	6.4	6,097

Measure Description

We recommend the installation of additional controls to optimize the operation of walk-in coolers and freezers.

Defrost controllers can be used to override defrost of evaporator fans when the defrost operation is not necessary, reducing annual energy consumption. This measure is applicable to existing evaporator fans with a traditional electric defrost mechanism.

The walk-in coolers and freezers also have evaporator fans which run continuously. The measure adds a control system feature to automatically shut off evaporator fans when the cooler's thermostat is not calling for cooling.

Energy savings for each of the control measures account for reduction in compressor and fan operating hours as well as reduction in the refrigeration heat load as appropriate.

4.1.8 Plug Load Equipment Control - Vending Machines

Our recommendation for plug load equipment control – vending machines upgrades is summarized in Figure 23 below.

Figure 23 - Summary of Plug Load Equipment Control – Vending Machines ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine		**12,935**	**0.0**	**0.0**	**$1,379.43**	**$3,450.00**	**$0.00**	**$3,450.00**	**2.5**	**13,025**
ECM 13	Vending Machine Control	12,935	0.0	0.0	$1,379.43	$3,450.00	$0.00	$3,450.00	2.5	13,025

ECM 13: 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_2e Emissions Reduction (lbs)
12,935	0.0	0.0	$1,379.43	$3,450.00	$0.00	$3,450.00	2.5	13,025

Measure Description

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

4.2 ECMs Evaluated but Not Recommended

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

Figure 24 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Custom Measures	**11,406**	**0.0**	**0.0**	**$1,163.40**	**$50,000.00**	**$0.00**	**$50,000.00**	**43.0**	**11,486**
Pool Cover Measure	11,406	0.0	0.0	$1,163.40	$50,000.00	$0.00	$50,000.00	43.0	11,486
TOTALS	**11,406**	**0.0**	**0.0**	**$1,163.40**	**$50,000.00**	**$0.00**	**$50,000.00**	**43.0**	**11,486**

* - 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).

Pool Cover Measure

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
11,406	0.0	0.0	$1,163.40	$50,000.00	$0.00	$50,000.00	43.0	11,486

Measure Description

We evaluated installing an automatic pool cover over the lap pool during unoccupied hours to reduce water evaporation, reduce heat loss, and lower the load on the dehumidifier suppling the space. Covering a pool traps heat and limits evaporation which lowers the humidity in the space; this in turn lowers the energy required to keep humidity levels within environmental standard for mold prevention.

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

Reasons for not Recommending

Although there is energy savings with installing a pool cover, the installation costs outweigh the energy cost savings. The economics of the measure cannot be justified on energy savings alone and, therefore, is not currently recommended.

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.

Develop a Lighting Maintenance Schedule

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

Ensure Lighting Controls Are Operating Properly

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

Turn Off Unneeded Motors

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

Reduce Motor Short Cycling

Frequent stopping and starting of motors subjects rotors and other parts to substantial stress. This can result in component wear, reducing efficiency, and increasing maintenance costs. Adjust the load on the motor to limit the amount of unnecessary stopping and starting to improve motor performance.

Perform Routine Motor Maintenance

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

Use Fans to Reduce Cooling Load

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

Practice Proper Use of Thermostat Schedules and Temperature Resets

Ensure thermostats are correctly set back. By employing proper set back temperatures and schedules, facility heating and cooling costs can be reduced dramatically during periods of low or no occupancy. As such, thermostats should be programmed for a setback of 5°F-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.

Assess Chillers & Request Tune-Ups

Chillers are responsible for a substantial portion of a commercial building's overall energy usage. When components of a chiller are not optimized, this can quickly result in a noticeable increase in energy bills. Chiller diagnostics can produce a 5% to 10% cost avoidance potential from discovery and implementation of low/no cost optimization strategies.

Clean Evaporator/Condenser Coils on AC Systems

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

Clean and/or Replace HVAC Filters

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

Perform Proper Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to retain proper functionality and efficiency of the heating system. Fuel burning equipment should undergo yearly tune-ups to ensure they are operating as safely and efficiently as possible from a combustion

standpoint. A tune-up should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Buildup of dirt, dust, or deposits on the internal surfaces of a boiler can greatly affect its heat transfer efficiency. These deposits can accumulate on the water side or fire side of the boiler. Boilers should be cleaned regularly according to the manufacturer's instructions to remove this build up in order to sustain efficiency and equipment life.

Perform Proper Furnace Maintenance

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

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.

Perform Maintenance on Compressed Air Systems

Like all electro-mechanical equipment, compressed air systems require periodic maintenance to operate at peak efficiency. A maintenance plan should be developed for process related compressed air systems to include inspection, cleaning, and replacement of inlet filter cartridges, cleaning of drain traps, daily inspection of lubricant levels to reduce unwanted friction, inspection of belt condition and tension, checking for system leaks and adjustment of loose connections, and overall system cleaning. Contact a qualified technician for help with setting up periodic maintenance schedule.

Plug Load Controls

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

Water Conservation

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

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

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

6 On-Site Generation Measures

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

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

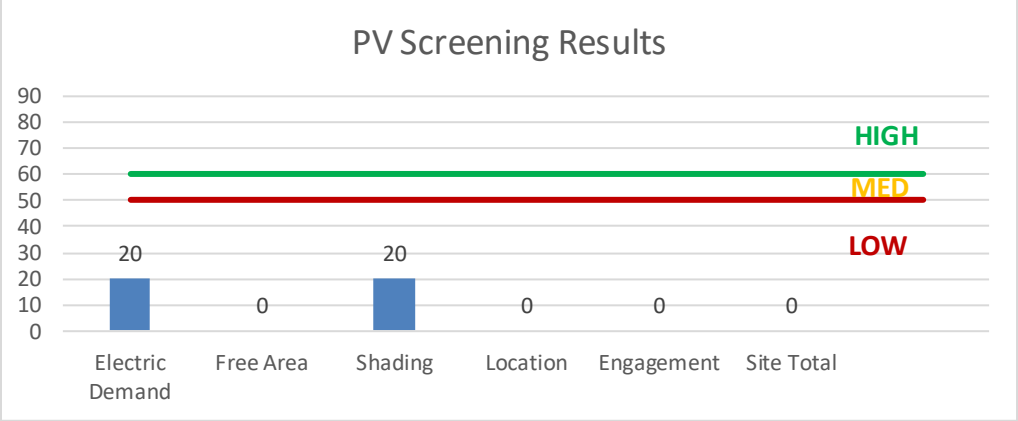
Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before making a decision to implement, a feasibility study should be conducted that would take a detailed look at existing energy profiles, siting, interconnection,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

6.1 Photovoltaic

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

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

Figure 25 - Photovoltaic Screening



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

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

6.2 Combined Heat and Power

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

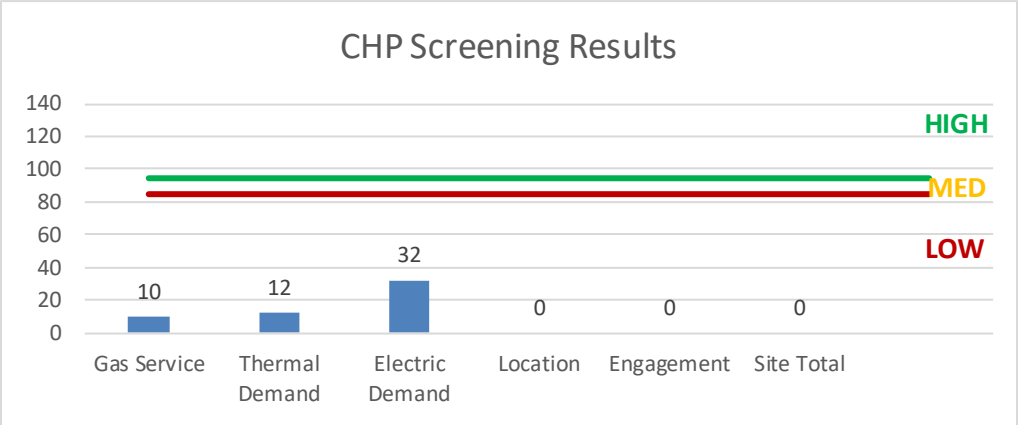
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

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

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

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

Figure 26 - Combined Heat and Power Screening



7 DEMAND RESPONSE

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

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

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

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

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

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

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

There is a moderate potential for demand response due to the size of the overall load, however, a DR feasibility study should involve a review of systems associated with pool pumping, ice making, and fountain pumping along with the traditional building conditioning systems.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund, your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 27 for a list of the eligible programs identified for each recommended ECM.

Figure 27 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	X			X		
ECM 2	Retrofit Fixtures with LED Lamps	X			X		
ECM 3	Install Occupancy Sensor Lighting Controls	X			X		
ECM 4	Install High/Low Lighitng Controls				X		
ECM 5	Premium Efficiency Motors				X		
ECM 6	Install VFDs on Constant Volume (CV) HVAC	X			X		
ECM 7	Install VFDs on Chilled Water Pumps	X			X		
ECM 8	Install VFDs on Hot Water Pumps				X		
ECM 9	Install VFDs on Cooling Tower Fans				X		
ECM 10	Install High Efficiency Chillers				X		
ECM 11	Install Low-Flow Domestic Hot Water Devices	X			X		
ECM 12	Refrigeration Controls				X		
ECM 13	Vending Machine Control				X		

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

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

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

8.1 SmartStart

Overview

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

Equipment with Prescriptive Incentives Currently Available:

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

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

Incentives

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

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

How to Participate

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

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

8.2 Pay for Performance - Existing Buildings

Overview

The Pay for Performance – Existing Buildings (P4P EB) program is designed for larger customers with a peak demand over 200 kW in any of the preceding 12 months. Under this program, the minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings. P4P EB is generally a good option for medium to large sized facilities looking to implement as many measures as possible under a single project in order to achieve deep energy savings. This program has an added benefit of evaluating a broad spectrum of measures that may not otherwise qualify under other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also utilize the P4P program.

Incentives

Incentives are calculated based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

To participate in the P4B EB program you will need to contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, the Partner will help further evaluate the measures identified in this report through development of the Energy Reduction Plan (ERP), assist you in implementing selected measures, and verify actual savings one year after the installation. At each of these three milestones, your Partner will also facilitate securing program incentives.

Approval of the final scope of work is required by the program prior to installation completion. Although installation can be accomplished by a contractor of your choice (some P4P EB Partners are also contractors) or by internal personnel, the Partner must remain involved to ensure compliance with the program guidelines and requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

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 description and application can be found at: www.njcleanenergy.com/ESIP.

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

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Gymnasium	12	Linear Fluorescent - T5HO: 4' T5HO (54W) - 4L	Wall Switch	234	6,760	Relamp	No	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	6,760	1.52	14,277	0.0	$1,522.56	$876.36	$240.00	0.42
Gymnasium	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Electrical Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.03	252	0.0	$26.88	$36.52	$10.00	0.99
Fitness Room	13	Linear Fluorescent - T5HO: 4' T5HO (54W) - 3L	Wall Switch	179	6,760	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	6,760	1.43	13,456	0.0	$1,434.96	$712.04	$195.00	0.36
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	6,760	0.04	378	0.0	$40.32	$54.77	$15.00	0.99
Room 104B	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.31	2,867	0.0	$305.73	$444.64	$110.00	1.09
Conference Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.31	2,867	0.0	$305.73	$444.64	$110.00	1.09
Hallway	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor Hallway	57	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	57	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	4,732	2.90	27,235	0.0	$2,904.42	$3,922.03	$855.00	1.06
Ground Floor Hallway	2	Compact Fluorescent: Recessed CFL 32W	Wall Switch	32	6,760	Relamp	No	2	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	19	6,760	0.02	199	0.0	$21.18	$34.45	$0.00	1.63
Front Desk	13	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	Yes	13	LED Screw-In Lamps: LED Screw-In Lamps	High/Low Control	13	4,732	0.18	1,678	0.0	$178.97	$832.45	$0.00	4.65
Front Desk	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	4,732	0.51	4,778	0.0	$509.55	$747.73	$150.00	1.17
Utility Room	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Utility Room	2	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	2	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.02	199	0.0	$21.18	$97.30	$0.00	4.59
Room 147A	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.36	3,345	0.0	$356.68	$499.41	$125.00	1.05
Front Desk Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.41	3,822	0.0	$407.64	$554.18	$140.00	1.02
Cash Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	6,760	0.04	378	0.0	$40.32	$54.77	$15.00	0.99
Hacky Office	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.36	3,345	0.0	$356.68	$499.41	$125.00	1.05
Women's Bathroom	6	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	6	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.06	596	0.0	$63.54	$291.90	$0.00	4.59
Women's Bathroom	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.44	4,141	0.0	$441.61	$744.70	$165.00	1.31
Men's Bathroom	6	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	6	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.06	596	0.0	$63.54	$291.90	$0.00	4.59
Men's Bathroom	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.44	4,141	0.0	$441.61	$744.70	$165.00	1.31
Elevator Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.05	504	0.0	$53.77	$73.03	$20.00	0.99
Room 145	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.15	1,433	0.0	$152.86	$280.32	$65.00	1.41
Front Lobby	22	LED - Fixtures: Recessed LED	Wall Switch	19	6,760	None	Yes	22	LED - Fixtures: Recessed LED	High/Low Control	19	4,732	0.10	958	0.0	$102.15	$200.00	$0.00	1.96

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Front Lobby	8	LED - Fixtures: Wall Sconce LED 13W	Wall Switch	13	6,760	None	No	8	LED - Fixtures: Wall Sconce LED 13W	Wall Switch	13	6,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Front Lobby	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Front Lobby	3	Compact Fluorescent: Chandelier 2x13W	Wall Switch	26	6,760	LED Retrofit	No	3	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	7	6,760	0.05	435	0.0	$46.43	$145.95	$0.00	3.14
Front Lobby	4	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	4	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.04	397	0.0	$42.36	$194.60	$0.00	4.59
Pool	16	Metal Halide: (1) 1000W Lamp	Wall Switch	1,080	6,760	Fixture Replacement	Yes	16	LED - Fixtures: Downlight Pendant	Occupancy Sensor	250	4,732	11.78	110,610	0.0	$11,795.77	$5,948.25	$640.00	0.45
Pool	5	Linear Fluorescent - T8: 8' T8 (59W) - 2L	None	110	6,760	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	None	29	6,760	0.33	3,094	0.0	$329.92	$182.58	$50.00	0.40
Pool	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pool	6	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	6	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.06	596	0.0	$63.54	$291.90	$0.00	4.59
Bathroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.14	1,274	0.0	$135.88	$416.06	$75.00	2.51
Bathroom	4	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	4	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.04	397	0.0	$42.36	$194.60	$0.00	4.59
Men's Locker Room	14	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	Yes	14	LED Screw-In Lamps: LED Screw-In Lamps	Occupancy Sensor	13	4,732	0.19	1,807	0.0	$192.74	$951.10	$35.00	4.75
Men's Locker Room	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Bathroom	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Bathroom	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.20	1,911	0.0	$203.82	$489.09	$95.00	1.93
Bathroom	3	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	3	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.03	298	0.0	$31.77	$145.95	$0.00	4.59
Electrical Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.05	504	0.0	$53.77	$73.03	$20.00	0.99
Pump Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.11	1,008	0.0	$107.53	$146.06	$40.00	0.99
Women's Locker Room	14	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	Yes	14	LED Screw-In Lamps: LED Screw-In Lamps	Occupancy Sensor	13	4,732	0.19	1,807	0.0	$192.74	$951.10	$35.00	4.75
Women's Locker Room	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 142	3	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	3	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.03	298	0.0	$31.77	$145.95	$0.00	4.59
Room 142	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.03	252	0.0	$26.88	$36.52	$10.00	0.99
Ice Skating Field	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ice Skating Field	45	Metal Halide: (1) 1000W Lamp	Wall Switch	1,080	6,760	Fixture Replacement	Yes	45	LED - Fixtures: Downlight Pendant	Occupancy Sensor	250	4,732	33.13	311,090	0.0	$33,175.61	$16,729.45	$1,800.00	0.45
Skate shop	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.76	7,167	0.0	$764.32	$1,091.59	$260.00	1.09
Women's Locker Room	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.37	3,504	0.0	$373.67	$671.67	$145.00	1.41

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Bathroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.10	956	0.0	$101.91	$379.55	$65.00	3.09
Bathroom	4	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	4	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.04	397	0.0	$42.36	$194.60	$0.00	4.59
Men's Locker Room	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.41	3,822	0.0	$407.64	$554.18	$140.00	1.02
Bathroom	4	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	4	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.04	397	0.0	$42.36	$194.60	$0.00	4.59
Bathroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.17	1,593	0.0	$169.85	$452.58	$85.00	2.16
Zamboni Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.20	1,911	0.0	$203.82	$335.09	$80.00	1.25
Room 119A	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.27	2,548	0.0	$271.76	$408.12	$100.00	1.13
Room 119A	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage/Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.15	1,433	0.0	$152.86	$280.32	$45.00	1.54
Cafeteria	11	Linear Fluorescent - T5HO: 4' T5HO (54W) - 3L	Wall Switch	179	6,760	Relamp	No	11	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	6,760	1.21	11,386	0.0	$1,214.20	$602.50	$165.00	0.36
Cafeteria	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	6,760	0.02	222	0.0	$23.62	$72.46	$0.00	3.07
Roller Skating Field	75	Linear Fluorescent - T5HO: 4' T5HO (54W) - 3L	Wall Switch	179	6,760	Relamp	No	75	LED - Linear Tubes: (6) 4' Lamps	Wall Switch	87	6,760	5.61	52,708	0.0	$5,620.91	$8,215.88	$2,250.00	1.06
Roller Skating Field	11	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	11	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Men's Bathroom	3	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	3	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.03	298	0.0	$31.77	$145.95	$0.00	4.59
Men's Bathroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.10	956	0.0	$101.91	$379.55	$65.00	3.09
Women's Bathroom	3	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	3	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.03	298	0.0	$31.77	$145.95	$0.00	4.59
Women's Bathroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.10	956	0.0	$101.91	$379.55	$65.00	3.09
Room 111B	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.17	1,593	0.0	$169.85	$298.58	$70.00	1.35
Emergency Exit	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Emergency Exit	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.05	504	0.0	$53.77	$73.03	$20.00	0.99
2nd Floor Stairway	3	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	3	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.03	298	0.0	$31.77	$145.95	$0.00	4.59
2nd Floor Stairway	1	Compact Fluorescent: Chandelier 2x13W	Wall Switch	26	6,760	LED Retrofit	No	1	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.01	99	0.0	$10.59	$48.65	$0.00	4.59
2nd Floor Stairway	5	Compact Fluorescent: Recessed 32W	Wall Switch	32	6,760	Relamp	Yes	5	LED Screw-In Lamps: LED Screw-In Lamps	High/Low Control	19	4,732	0.08	714	0.0	$76.17	$286.13	$0.00	3.76
Ease-West Wing Hallway	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.71	6,689	0.0	$713.37	$966.82	$700.00	0.37
Ease-West Wing Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
2nd Floor Main Lobby	44	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	44	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	4,732	2.24	21,024	0.0	$2,242.01	$2,609.99	$660.00	0.87
2nd Floor Main Lobby	2	Compact Fluorescent: Wall Sconce 14W	Wall Switch	14	6,760	Relamp	No	2	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	7	6,760	0.01	107	0.0	$11.40	$34.45	$0.00	3.02
2nd Floor Main Lobby	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Women's Bathroom	4	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	4	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.04	397	0.0	$42.36	$194.60	$0.00	4.59
Women's Bathroom	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.31	2,867	0.0	$305.73	$598.64	$125.00	1.55
Men's Bathroom	4	Compact Fluorescent: Recessed 1x26W 4-PIN	Wall Switch	26	6,760	LED Retrofit	No	4	LED Screw-In Lamps: LED Screw-In Lamps	Wall Switch	13	6,760	0.04	397	0.0	$42.36	$194.60	$0.00	4.59
Men's Bathroom	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.31	2,867	0.0	$305.73	$598.64	$125.00	1.55
Wolf P. Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.31	2,867	0.0	$305.73	$444.64	$110.00	1.09
Cardio Room	18	Linear Fluorescent - T5HO: 4' T5HO (54W) - 3L	Wall Switch	179	6,760	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	2.18	20,425	0.0	$2,178.23	$1,255.91	$305.00	0.44
Cardio Room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Learning Center	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Learning Center	17	Linear Fluorescent - T5HO: 4' T5HO (54W) - 3L	Wall Switch	179	6,760	Relamp	Yes	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	2.05	19,291	0.0	$2,057.21	$1,201.13	$290.00	0.44
Running Track	14	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	176	6,760	Relamp	No	14	LED - Linear Tubes: (6) 4' Lamps	Wall Switch	87	6,760	1.01	9,518	0.0	$1,015.02	$1,533.63	$420.00	1.10
Running Track	4	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	6,760	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.10	947	0.0	$101.01	$146.06	$40.00	1.05
Running Track	8	Linear Fluorescent - T8: 8' T8 (59W) - 2L	None	110	6,760	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	None	29	6,760	0.53	4,950	0.0	$527.88	$292.12	$80.00	0.40
Room 204 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.07	637	0.0	$67.94	$189.03	$20.00	2.49
Room 205 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.05	504	0.0	$53.77	$73.03	$20.00	0.99
Maintenance Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.20	1,911	0.0	$203.82	$335.09	$80.00	1.25
Track Maintenance Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.10	956	0.0	$101.91	$225.55	$50.00	1.72
Maintenance Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.20	1,911	0.0	$203.82	$335.09	$80.00	1.25
Maintenance Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.17	1,593	0.0	$169.85	$298.58	$70.00	1.35
Pump Room Stairway	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	6,760	0.04	378	0.0	$40.32	$54.77	$15.00	0.99
Pump Room Stairway	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pump Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.05	504	0.0	$53.77	$73.03	$20.00	0.99
Telecom Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.07	637	0.0	$67.94	$189.03	$20.00	2.49

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Laundry Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	4,732	0.07	637	0.0	$67.94	$273.03	$20.00	3.72
Room 211	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.20	1,911	0.0	$203.82	$335.09	$80.00	1.25
Room 214B	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.81	7,645	0.0	$815.28	$1,146.36	$275.00	1.07
Room 214B	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 215B	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	4,732	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.40	2,647	0.0	$282.27	$547.73	$150.00	1.41
Room 215B	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 216	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	4,732	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.64	4,235	0.0	$451.63	$876.36	$240.00	1.41
Room 216	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	4,732	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,732	0.05	353	0.0	$37.64	$73.03	$20.00	1.41
Hallway	32	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	Yes	32	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	4,732	1.01	9,509	0.0	$1,014.05	$2,518.72	$0.00	2.48
Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	10	Compact Fluorescent: Wall Sconce 2x26W 4-PIN	Wall Switch	54	6,760	LED Retrofit	Yes	10	LED Screw-In Lamps: LED Screw-In Lamps	High/Low Control	13	4,732	0.37	3,430	0.0	$365.77	$686.50	$0.00	1.88
Room213A	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.46	4,300	0.0	$458.59	$608.95	$155.00	0.99
Electrical Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,760	0.05	504	0.0	$53.77	$73.03	$20.00	0.99
Director Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	6,760	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,732	0.31	2,867	0.0	$305.73	$444.64	$110.00	1.09
Exterior Perimeter West Wing	6	Compact Fluorescent: Wall Sconce 26W 4-PIN	Daylight Dimming	26	4,380	LED Retrofit	No	6	LED Screw-In Lamps: LED Screw-In Lamps	Daylight Dimming	13	4,380	0.06	386	0.0	$41.17	$291.90	$0.00	7.09
Exterior Perimeter East Wing	6	Compact Fluorescent: Wall Sconce 26W 4-PIN	Daylight Dimming	26	4,380	LED Retrofit	No	6	LED Screw-In Lamps: LED Screw-In Lamps	Daylight Dimming	13	4,380	0.06	386	0.0	$41.17	$291.90	$0.00	7.09
Exterior Perimeter North Wing	4	Compact Fluorescent: Wall Sconce 26W 4-PIN	Daylight Dimming	26	4,380	LED Retrofit	No	4	LED Screw-In Lamps: LED Screw-In Lamps	Daylight Dimming	13	4,380	0.04	257	0.0	$27.45	$194.60	$0.00	7.09
Exterior Perimeter Pole Lighting	35	Metal Halide: (1) 400W Lamp	Daylight Dimming	458	4,380	Fixture Replacement	No	35	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	125	4,380	9.48	57,685	0.0	$6,151.73	$33,808.79	$3,500.00	4.93
Front Uplight	6	LED - Fixtures: 44W Ground Uplight LED	Daylight Dimming	44	4,380	None	No	6	LED - Fixtures: 44W Ground Uplight LED	Daylight Dimming	44	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Front Entrance	4	Metal Halide: (1) 70W Lamp	Daylight Dimming	95	4,380	Fixture Replacement	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	21	4,380	0.24	1,465	0.0	$156.23	$1,400.00	$400.00	6.40
Parking Lot	33	Metal Halide: (1) 400W Lamp	Daylight Dimming	458	4,380	Fixture Replacement	No	33	LED - Fixtures: Parking Garage Fixture	Daylight Dimming	125	4,380	8.94	54,389	0.0	$5,800.21	$22,194.62	$3,300.00	3.26
Emergency Exit	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	8,760	Relamp	No	10	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	8,760	0.14	1,732	0.0	$184.74	$182.58	$50.00	0.72

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Skating Area	Skating Area	3	Supply Fan	0.3	78.0%	No	2,745	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pump Room1	Pool	1	Heating Hot Water Pump	0.5	68.0%	No	2,745	No	68.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pump Room1	Pool	1	Heating Hot Water Pump	10.0	89.5%	No	3,391	No	89.5%	Yes	1	1.34	13,115	0.0	$1,398.60	$3,807.95	$0.00	2.72
Pump Room1	Pool	1	Process Pump	3.0	86.5%	No	3,640	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 119A	Ice Rink	2	Chilled Water Pump	25.0	90.2%	No	4,067	Yes	93.6%	Yes	2	7.21	79,600	0.0	$8,488.77	$21,690.46	$3,000.00	2.20
Room 119A	Ice Rink	1	Condenser Water Pump	7.5	91.0%	No	3,391	Yes	91.0%	No		0.00	0	0.0	$0.00	$1,131.44	$0.00	0.00
Room 119A	Compressor	1	Process Pump	100.0	92.0%	No	5,329	Yes	95.4%	No		1.71	12,320	0.0	$1,313.86	$7,041.45	$0.00	5.36
Room 119A	Compressor	1	Process Pump	100.0	89.0%	No	5,329	Yes	95.4%	No		3.33	23,973	0.0	$2,556.52	$7,041.45	$0.00	2.75
Room 119A	Chiller Room	2	Process Pump	2.0	86.0%	No	3,640	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rear Building	Cooling Tower	1	Cooling Tower Fan	15.0	89.0%	No	3,391	Yes	93.0%	Yes	2	0.29	20,252	0.0	$2,159.75	$9,060.32	$0.00	4.20
Pump Room2	Ice Rink & Bathrooms	4	Other	0.1	71.0%	No	2,745	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pump Room2	Pump Room2	2	Other	0.3	71.0%	No	2,745	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage Room	Storage Room	1	Other	0.1	71.0%	No	2,745	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Building	1	Exhaust Fan	1.5	82.0%	No	3,640	No	82.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Building	2	Exhaust Fan	0.2	71.0%	No	3,640	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Building	2	Exhaust Fan	0.3	71.0%	No	3,640	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Kitchen	1	Exhaust Fan	3.0	86.0%	No	3,640	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Building	1	Exhaust Fan	0.1	71.0%	No	3,640	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Building	3	Exhaust Fan	7.5	84.0%	No	3,640	Yes	88.5%	Yes	3	3.82	15,918	0.0	$1,697.53	$14,728.10	$1,800.00	7.62
Rooftop	Building	1	Exhaust Fan	1.5	84.0%	No	3,640	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Facility Park	Facility Park	1	Water Supply Pump	0.5	71.0%	No	4,368	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Facility Park	Facility Park	1	Water Supply Pump	2.0	82.0%	No	4,368	No	82.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Facility Park	Facility Park	1	Water Supply Pump	0.3	71.0%	No	4,368	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Facility Park	Facility Park	1	Water Supply Pump	1.5	82.0%	No	4,368	No	82.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 15	Roller Rink	2	Supply Fan	20.0	94.5%	Yes	3,391	No	94.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 15	Roller Rink	2	Exhaust Fan	7.5	92.5%	Yes	3,391	No	92.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 14	Swimming-Pool Water Heat Pump	1	Supply Fan	20.0	94.0%	Yes	3,391	No	94.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	48VL-B2404030GS	1	Supply Fan	0.5	78.0%	No	3,640	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	48HCTA06E2A6A2FH	4	Supply Fan	0.5	78.0%	No	3,640	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	48HCTA07F2A6A	1	Supply Fan	0.5	78.0%	No	3,640	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	48HCSE08F2A6A2F	2	Supply Fan	0.5	78.0%	No	3,640	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	48HCSE09F2A6A2F	1	Supply Fan	0.5	78.0%	No	3,640	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	48HCTE14F2A6A2FH	1	Supply Fan	0.5	78.0%	No	3,640	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	48HCSE24FBA6A2F	1	Supply Fan	0.5	78.0%	No	3,640	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	48HCTD28ECA6A2F	1	Supply Fan	0.5	78.0%	No	3,640	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof Top Unit 1	Maintenance	1	Packaged AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 2	Locker Rooms	1	Packaged AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 3	Cafeteria	1	Packaged AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 4	Billiards/Vito Rooms	1	Packaged AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 5	Rooms 213/214/215	1	Packaged AC	10.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 6	Skate Rental Room	1	Packaged AC	6.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 7	Wellness Center	1	Packaged AC	7.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 8	Learning Room	1	Packaged AC	7.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 9	Office/Weight Room/Senior Center	1	Packaged AC	8.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 10	Adminstration Offices	1	Packaged AC	12.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 11	Lobby	1	Packaged AC	20.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 12	Gymnasium	1	Packaged AC	25.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 13	Pool Lockers Rooms	1	Packaged AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 14	Swimming-Pool	1	Packaged AC	30.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 15	Roller Rink	1	Packaged AC	70.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 16	Ice Rink	1	Packaged AC	60.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric Chiller Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 119A - Chiller Room	Ice Rink Area	1	Water-Cooled Reciprocating Chiller	110.00	Yes	1	Water-Cooled Reciprocating Chiller	Variable	110.00	0.75	0.48	14.15	92,252	0.0	$9,838.05	$95,494.23	$4,730.00	9.23

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
Pump Room1	Pool	1	Non-Condensing Hot Water Boiler	881.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 119A	Room 119A	2	Warm Air Unit Heater	50.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pump Room2	Pump Room2	1	Warm Air Unit Heater	50.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 1	Maintenance	1	Furnace	33.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 5	Rooms 213/214/215	1	Furnace	320.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 2	Locker Rooms	1	Furnace	120.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 6	Skate Rental Room	1	Furnace	120.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 3	Cafeteria	1	Furnace	120.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 15	Roller Rink	1	Furnace	648.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 4	Billiards/Vito Rooms	1	Furnace	120.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 10	Adminstration Offices	1	Furnace	195.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 7	Wellness Center	1	Furnace	103.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 8	Learning Room	1	Furnace	103.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 9	Office/Weight Room/Senior Center	1	Furnace	103.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 11	Lobby	1	Furnace	324.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 14	Swimming-Pool Water Heater	1	Furnace	480.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 13	Pool Lockers Rooms	1	Furnace	120.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top Unit 12	Gymnasium	1	Furnace	324.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

DHW Inventory & Recommendations

		Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Pump Room 2	Bathrooms & Ice Rink	2	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage Room	Cafeteria & Locker Rooms	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Facility	53	Faucet Aerator (Lavatory)	2.20	1.00	0.00	0	28.9	$261.50	$380.01	$0.00	1.45
Facility	3	Faucet Aerator (Kitchen)	2.50	2.20	0.00	0	1.5	$13.88	$21.51	$0.00	1.55

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions			Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Cafeteria	1	Cooler (35F to 55F)	No	Yes	Yes	0.12	2,854	0.0	$304.33	$2,192.60	$125.00	6.79
Cafeteria	1	Medium Temp Freezer (0F to 30F)	No	Yes	Yes	0.13	3,201	0.0	$341.37	$2,192.60	$125.00	6.06

Commercial Refrigerator/Freezer Inventory & Recommendations

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

Commercial Ice Maker Inventory & Recommendations

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

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Cafeteria	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Cafeteria	1	Gas Griddle (≤2 Feet Width)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Cafeteria	1	Gas Convection Oven (Full Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Facility	35	Desktop Computer	191.0	Yes
Facility	5	Copy Machine	1,000.0	Yes
Facility	11	Printer	560.0	Yes
Facility	8	Wall Mounted TV	224.0	No
Facility	9	Refrigerator	350.0	Yes
Laundry Room	1	Washing Machine	1,500.0	Yes
Laundry Room	1	Electric Dryer	5,400.0	Yes
Hacky Office	2	ATM Machine	250.0	Yes
Cafeteria	1	Refrigerator	450.0	No
Fitness Center Equipment	63	Various Types	144.0	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
Facility	9	Glass Fronted Refrigerated	Yes	0.00	10,880	0.0	$1,160.27	$2,070.00	$0.00	1.78
Facility	6	Non-Refrigerated	Yes	0.00	2,055	0.0	$219.16	$1,380.00	$0.00	6.30

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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N/A

ENERGY STAR® Score[1]

Community Center

Primary Property Type: Fitness Center/Health Club/Gym
Gross Floor Area (ft²): 167,978
Built: 2003

For Year Ending: June 30, 2017
Date Generated: July 23, 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
Community Center 600 Main Street Woodbridge, New Jersey 7095	Township of Woodbridge 1 Main Street Woodbridge, NJ 07095 732-634-4450	Brian Burke 1 Main Street Woodbridge, NJ 07095 732-634-4450 Brian.Burke@twp.woodbridge.nj.us

Property ID: 5880910

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
130 kBtu/ft²

Source EUI
271.4 kBtu/ft²

Annual Energy by Fuel	
Electric - Solar (kBtu)	1,151,724 (5%)
Natural Gas (kBtu)	9,820,983 (45%)
Electric - Grid (kBtu)	10,865,435 (50%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	46.4
National Median Source EUI (kBtu/ft²)	96.8
% Diff from National Median Source EUI	180%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	2,154

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

___ _____
,
(___)___-_____
_____

Professional Engineer Stamp (if applicable)