# Local Government Energy Audit:
## Energy Audit Report


***Mystic Island Volunteer Fire Company***

827 A, Radio Road

Little Egg Harbor, NJ 08087

Mystic Island Volunteer Fire Co

September 10, 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 saving are included in this report to help make decisions about reducing energy use at the facility. This report, however, is not intended to serve as a detailed engineering design document. Further design and analysis may be necessary in order to implement some of the measures recommended in this report.

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

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

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

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# 1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for the Mystic Island Volunteer Fire Company.

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 Mystic Island Volunteer Fire Company is an 8,000 square foot, two-story facility comprised of engine bays, restrooms, a kitchen, offices, an assembly hall, an entertainment area for the fire fighters, and a mechanical space. The building does not have a scheduled occupancy except for one person occupying the office for two hours per day.

The lower level hall and engine bay areas are heated using a non-condensing boiler, and the upper level (offices and entertainment air) are heated using two forced air furnaces. Cooling is provided using split AC units serving both levels.

Lighting at the Mystic Island Volunteer Fire Company consists of aging and inefficient lighting T12 linear tube fixtures in the engine areas and a mixture of T8 linear tubes, compact fluorescent lamps and incandescent lamps in the other areas. 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 12 measures and recommends nine measures which together represent an opportunity for the Mystic Island Volunteer Fire Company to reduce annual energy costs by $4,370 and annual greenhouse gas emissions by 32,655 lbs $CO_2e$. We estimate that if all measures were implemented as recommended, the project would pay for itself in 9.6 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce the Mystic Island Volunteer Fire Company's annual energy use by 32%.

*Figure 1 – Previous 12 Month Utility Costs*

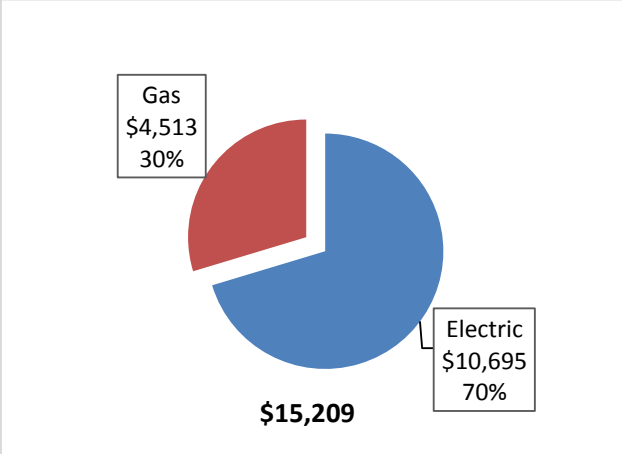
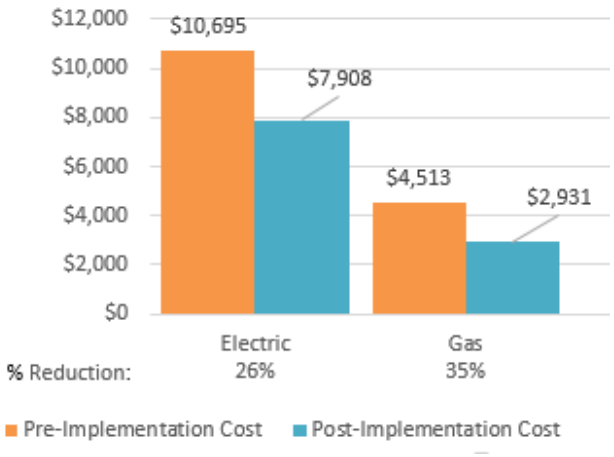



*Figure 2 – Potential Post-Implementation Costs*




A detailed description of the Mystic Island Volunteer Fire Company's existing energy use can be found in Section 3.

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

*Figure 3 – Summary of Energy Reduction Opportunities*

| Energy Conservation Measure | | Recommend? | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lighting Upgrades** | | | **12,666** | **7.3** | **0.0** | **$2,461.42** | **$15,869.29** | **$1,165.00** | **$14,704.29** | **6.0** | **12,755** |
| ECM 1 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | Yes | 6,371 | 3.7 | 0.0 | $1,238.18 | $8,837.83 | $510.00 | $8,327.83 | 6.7 | 6,416 |
| ECM 2 | Retrofit Fixtures with LED Lamps | Yes | 6,295 | 3.6 | 0.0 | $1,223.24 | $7,031.45 | $655.00 | $6,376.45 | 5.2 | 6,339 |
| **Lighting Control Measures** | | | **1,180** | **0.7** | **0.0** | **$229.22** | **$2,412.00** | **$390.00** | **$2,022.00** | **8.8** | **1,188** |
| ECM 3 | Install Occupancy Sensor Lighting Controls | Yes | 1,126 | 0.6 | 0.0 | $218.86 | $2,162.00 | $255.00 | $1,907.00 | 8.7 | 1,134 |
| ECM 4 | Install Daylight Dimming Controls | Yes | 53 | 0.0 | 0.0 | $10.36 | $250.00 | $135.00 | $115.00 | 11.1 | 54 |
| **Motor Upgrades** | | | **499** | **0.1** | **0.0** | **$97.06** | **$536.42** | **$0.00** | **$536.42** | **5.5** | **503** |
| ECM 5 | Premium Efficiency Motors | Yes | 499 | 0.1 | 0.0 | $97.06 | $536.42 | $0.00 | $536.42 | 5.5 | 503 |
| **Electric Unitary HVAC Measures** | | | **1,600** | **1.5** | **0.0** | **$310.93** | **$13,465.98** | **$828.00** | **$12,637.98** | **40.6** | **1,611** |
| | Install High Efficiency Electric AC | No | 1,600 | 1.5 | 0.0 | $310.93 | $13,465.98 | $828.00 | $12,637.98 | 40.6 | 1,611 |
| **Gas Heating (HVAC/Process) Replacement** | | | **0** | **0.0** | **63.6** | **$647.06** | **$11,616.11** | **$2,700.00** | **$8,916.11** | **13.8** | **7,446** |
| ECM 6 | Install High Efficiency Furnaces | Yes | 0 | 0.0 | 24.8 | $251.90 | $5,437.76 | $1,200.00 | $4,237.76 | 16.8 | 2,899 |
| ECM 7 | Install Low-Intensity Infrared Heating | Yes | 0 | 0.0 | 38.8 | $395.16 | $6,178.35 | $1,500.00 | $4,678.35 | 11.8 | 4,548 |
| **Domestic Water Heating Upgrade** | | | **0** | **0.0** | **5.4** | **$54.77** | **$4,456.17** | **$150.00** | **$4,306.17** | **78.6** | **630** |
| | Install High Efficiency Gas Water Heater | No | 0 | 0.0 | 4.9 | $49.56 | $4,449.00 | $150.00 | $4,299.00 | 86.7 | 570 |
| ECM 8 | Install Low-Flow Domestic Hot Water Devices | Yes | 0 | 0.0 | 0.5 | $5.21 | $7.17 | $0.00 | $7.17 | 1.4 | 60 |
| **Food Service Equipment & Refrigeration Measures** | | | **554** | **0.1** | **91.4** | **$1,037.71** | **$19,407.01** | **$975.00** | **$18,432.01** | **17.8** | **11,261** |
| ECM 9 | Food Service Equipment Replacement | Yes | 0 | 0.0 | 91.4 | $930.05 | $16,598.81 | $750.00 | $15,848.81 | 17.0 | 10,703 |
| | Replace Refrigeration Equipment | No | 554 | 0.1 | 0.0 | $107.66 | $2,808.20 | $225.00 | $2,583.20 | 24.0 | 558 |
| **TOTAL OF ALL EVALUATED ECMS** | | | **16,499** | **9.7** | **160.4** | **$4,838.16** | **$67,762.97** | **$6,208.00** | **$61,554.97** | **12.7** | **35,394** |
| **TOTAL OF ALL RECOMMENDED ECMS** | | | **14,345** | **8** | **156** | **$ 4,370.01** | **$ 47,039.79** | **$ 5,005.00** | **$ 42,034.79** | **9.6** | **32,655** |
| **TOTAL OF ALL NON-RECOMMENDED ECMS** | | | **2,154** | **2** | **5** | **$ 468.15** | **$ 20,723.18** | **$ 1,203.00** | **$ 19,520.18** | **41.7** | **2,739** |

* - 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.

**Electric Unitary HVAC** measures generally involve replacing older inefficient air conditioning systems with modern energy efficient systems. New air conditioning systems can provide equivalent cooling to older air condition systems at a reduced energy cost. These measures save energy by reducing the power used by the air conditioning systems, due to improved electrical efficiency.

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

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

**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.

## Energy Efficient Practices

TRC also identified six 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 Mystic Island Volunteer Fire Company include:

- Perform Proper Lighting Maintenance
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Clean Evaporator/Condenser Coils on AC Systems
- Perform Proper Furnace Maintenance
- Perform Proper Water Heater Maintenance
- 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 Mystic Island Volunteer Fire Company. Based on the configuration of the site and its loads there is a low potential for installing any 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
- Direct Install
- Energy Savings Improvement Program (ESIP)

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

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

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.3 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** | | | |
| Jeffrey Petrauskas | Fire Fighter | jeffrey.petrauskas@gmail.com | 609-713-1113 |
| **TRC Energy Services** | | | |
| Smruti Srinivasan | Auditor | ssrinivasan@trcsolutions.com | (732) 855-0033 |

## 2.2 General Site Information

On December 07, 2017, TRC performed an energy audit at the Mystic Island Volunteer Fire Company located in Little Egg Harbor, New Jersey. TRC's team met with Jeffrey Petrauskas to review the facility operations and help focus our investigation on specific energy-using systems.

The Volunteer Fire Company is an 8,000 square foot, two-story facility comprised of engine bays, restrooms, a kitchen, offices, an assembly hall, an entertainment area for the fire fighters, and a mechanical space. The building does not have a scheduled occupancy except for one person occupying the office for two hours. The building was constructed in 1974.

The lower level hall and engine bay areas are heated using a non-condensing boiler, and the upper level (offices and entertainment air) are heated using two forced air furnaces. Cooling is provided using split AC units serving both levels.

Lighting at the Mystic Island Volunteer Fire Company consists of aging and inefficient lighting T12 linear tube fixtures in the engine areas and a mixture of T8 linear tubes, compact fluorescent lamps and incandescent lamps in the other areas.

## 2.3 Building Occupancy

The typical schedule is presented in the table below. The building is regularly occupied for two hours per day by a single staff member using the office. The assembly hall is rented out for functions. Once a week there is a department meeting for about six hours. There are 25 fire fighters using the entertainment area and the engine bay area intermittently. There is no scheduled occupancy at the facility.

*Figure 5 - Building Schedule*

| Building Occupancy Schedule | | |
|---|---|---|
| **Building Name** | **Weekday/Weekend** | **Operating Schedule** |
| Mystic Island Volunteer Fire Company | Weekday | 8AM - 10AM |
| Mystic Island Volunteer Fire Company | Weekend | No operation |

## 2.4 Building Envelope

The assembly hall and the pick-up truck areas are constructed of concrete blocks. The engine bay areas and the upper level are wooden framed and dry wall construction. The facility has a vinyl siding façade. The building has a pitched roof with asphalt shingles which were changed approximately ten years ago (~2008). The building has double pane windows which are in good condition. The exterior doors in the engine areas are hoist doors with glass exteriors. The hall entrance has a metal framed glass door.


## 2.5 On-Site Generation

The Mystic Island Volunteer Fire Company does not have any on-site electric generation systems currently installed.

## 2.6 Energy-Using Systems

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

### Lighting System

Lighting at the facility is provided mostly by 4-foot 32-Watt linear fluorescent T8 lamps with electronic ballasts as well as some 8-foot fluorescent T12 lamps located in the engine bay areas. Smaller spaces also have compact fluorescent lamps (CFL) and the assembly hall has some recessed can 90-Watt halogen incandescent lamps.

Lighting control in most spaces is provided by manual wall switches. The building's exterior lighting is minimal and consists primarily of three canopy fixtures with two 18-Watt CFL lamps each.

## Hot Water (or Steam) Heating System

The engine space is heated using a gas-fired, non-condensing, HB Smith hot water boiler with an output capacity of 208 MBh. The boiler has a combustion efficiency of 83.20% and the hot water is circulated using a constant speed fractional horsepower pump. The engine areas have warm air unit heaters with hot water coils supplied from the boiler. The boiler is 21 years old.

There are two gas-fired (Rheem), forced air furnaces with an output capacity of 80 MBh and a combustion efficiency of 80%. The furnaces serve the assembly hall and kitchen on the lower level and the offices and entertainment areas on the upper level, respectively. Both furnaces are 20 years old and have been evaluated for replacement.

The space temperatures are controlled using programmable thermostats at the facility. Although the building is intermittently occupied, the HVAC systems runs at setpoints even during unoccupied hours, to maintain moisture in the building. The heating setpoint in the building is 68°F and run for a fixed amount of time.

## Direct Expansion Air Conditioning System (DX)

The assembly hall, offices and the entertainment areas are the only spaces that have cooling in the facility. The assembly hall is cooled using two 5-ton split AC units. One of them was installed in 2012 and the other in 1998. The unit cooling the offices and the entertainment area is 4-tons and was installed in 1998. The upper level (containing the offices and the entertainment area) is occupied every day. During summer, the whole upper level is cooled in order to provide space cooling even at minimal occupancy. The cooling setpoint in the building is 72$^{o}$F. The units are manually controlled by a thermostat located in the respective zones. The split AC units from 1998 and have been evaluated for replacement.

## Domestic Hot Water Heating System

The domestic hot water heating system for the facility consists of one gas-fired AO Smith water heater with an input capacity of 75 MBh and a tank capacity of 75 gallons. The unit has an efficiency of 78%. The water heater is at least 15 years old and has been evaluated for replacement.

## Food Service & Refrigeration

The firehouse has a small commercially equipped kitchen. This is comprised of one commercial solid door reach-in refrigerator and a freezer (Superior). These are both approximately 20 years old. There is one gas-fired range/oven (Garland) with four burners. There are two ice-making machines (Manitowoc) in the kitchen and the engine area. Older kitchen equipment have been evaluated for replacement.

## Building Plug Load

The building has minimal plug load that includes computers, printers, paper shredders, microwave oven, refrigerators, coffee machines and televisions. Most of the equipment is ENERGY STAR® rated. Additional equipment includes an air compressor, hoist doors, and miscellaneous equipment associated with the engine bay. There is no centralized PC power management software installed.

## 2.7 Water-Using Systems

The restrooms found at the facility have faucets that are rated for 2.0 gallons per minute (gpm) or lower, the toilets are rated at 1.6 gallons per flush (gpf) and the urinals are rated at 1.6 gpf.

# 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

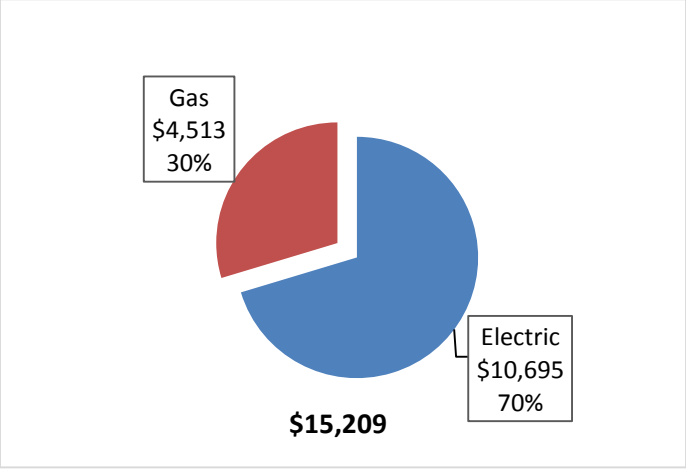
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

*Figure 6 - Utility Summary*

| Utility Summary for Mystic Island Vol Fire Company | | |
|---|---|---|
| **Fuel** | **Pre-Implementation Usage** | **Pre-Implementation Cost** |
| Electric | 55,037 kWh | $10,695 |
| Natural Gas | 4,436 Therms | $4,513 |

The current annual energy cost for this facility is $15,209 as shown in the chart below.

*Figure 7 - Energy Cost Breakdown*



## 3.2 Electricity Usage

Electricity is provided by Atlantic City Electric. The average electric cost over the past 12 months was $0.194/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

*Figure 8 - Electric Usage & Demand*

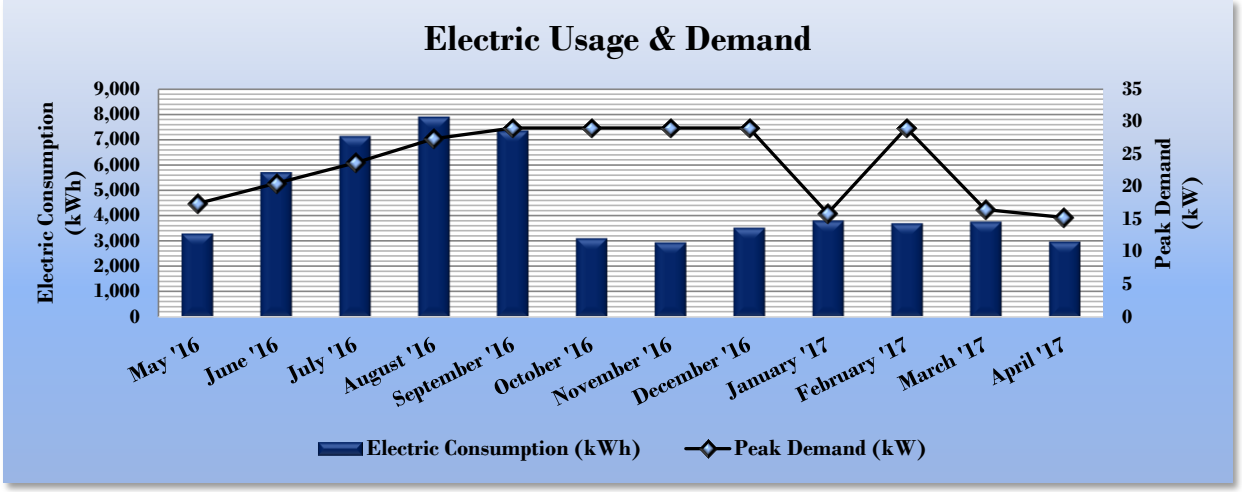



*Figure 9 - Electric Usage & Demand*

| Electric Billing Data for Mystic Island Vol Fire Company | | | | | |
|---|---|---|---|---|---|
| Period Ending | Days in Period | Electric Usage (kWh) | Demand (kW) | Demand Cost | Total Electric Cost |
| 5/25/16 | 30 | 3,300 | 17 | | $686 |
| 6/27/16 | 33 | 5,703 | 21 | | $1,096 |
| 7/26/16 | 29 | 7,129 | 24 | | $1,321 |
| 8/25/16 | 30 | 7,887 | 27 | | $1,477 |
| 9/27/16 | 33 | 7,340 | 29 | | $1,410 |
| 10/25/16 | 28 | 3,115 | 29 | | $645 |
| 11/22/16 | 28 | 2,948 | 29 | | $613 |
| 12/22/16 | 30 | 3,528 | 29 | | $718 |
| 1/26/17 | 35 | 3,801 | 16 | | $722 |
| 2/23/17 | 28 | 3,693 | 29 | | $739 |
| 3/24/17 | 29 | 3,762 | 17 | | $716 |
| 4/26/17 | 33 | 2,982 | 15 | | $582 |
| **Totals** | **366** | **55,188** | **29.02** | **$0** | **$10,725** |
| **Annual** | **365** | **55,037** | **29.02** | **$0** | **$10,695** |

## 3.3 Natural Gas Usage

Natural gas is provided by New Jersey Natural Gas. The average gas cost for the past 12 months is $1.017/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*

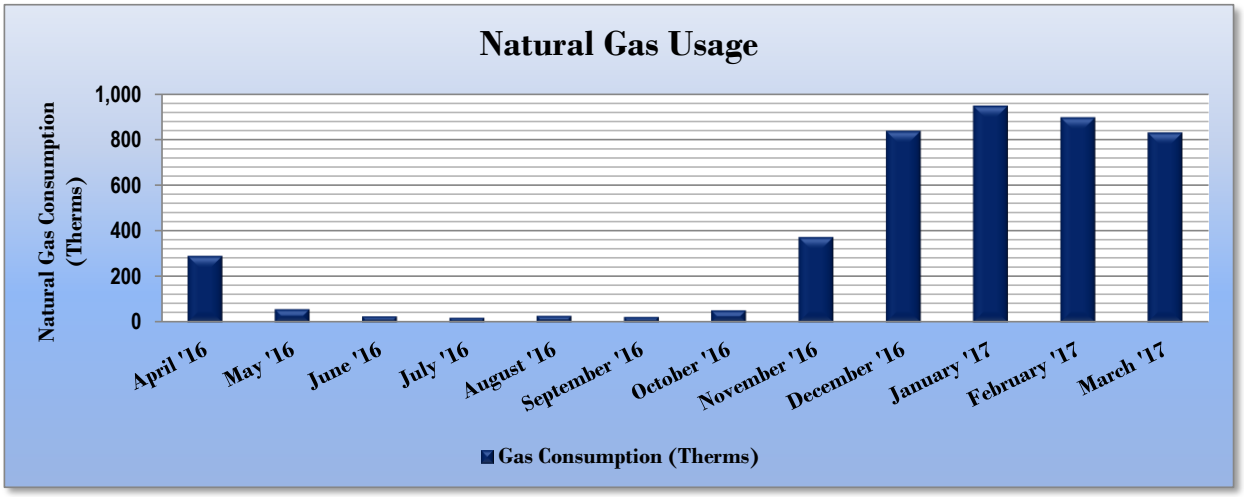



*Figure 11 - Natural Gas Usage*

| Gas Billing Data for Mystic Island Vol Fire Company | | | |
|---|---|---|---|
| Period Ending | Days in Period | Natural Gas Usage (Therms) | Natural Gas Cost |
| 5/12/16 | 30 | 290 | $309 |
| 6/10/16 | 29 | 58 | $142 |
| 7/12/16 | 32 | 26 | $119 |
| 8/5/16 | 24 | 20 | $96 |
| 9/9/16 | 35 | 29 | $120 |
| 10/6/16 | 27 | 24 | $108 |
| 11/7/16 | 32 | 53 | $77 |
| 12/7/16 | 30 | 373 | $330 |
| 1/6/17 | 30 | 836 | $707 |
| 2/3/17 | 28 | 945 | $796 |
| 3/9/17 | 34 | 894 | $809 |
| 4/7/17 | 29 | 828 | $838 |
| **Totals** | **360** | **4,375** | **$4,451** |
| **Annual** | **365** | **4,436** | **$4,513** |

## 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 | | |
|---|---|---|
| | Mystic Island Vol Fire Company | National Median<br>Building Type: Fire/Police Station |
| Source Energy Use Intensity (kBtu/ft$^2$) | 131.9 | 154.4 |
| Site Energy Use Intensity (kBtu/ft$^2$) | 78.9 | 88.3 |

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 | | |
|---|---|---|
| | Mystic Island Vol Fire Company | National Median<br>Building Type: Fire/Police Station |
| Source Energy Use Intensity (kBtu/ft$^2$) | 92.3 | 154.4 |
| Site Energy Use Intensity (kBtu/ft$^2$) | 53.4 | 88.3 |

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. Your building is not is one of the building categories that are eligible to receive a score based on the building type.

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

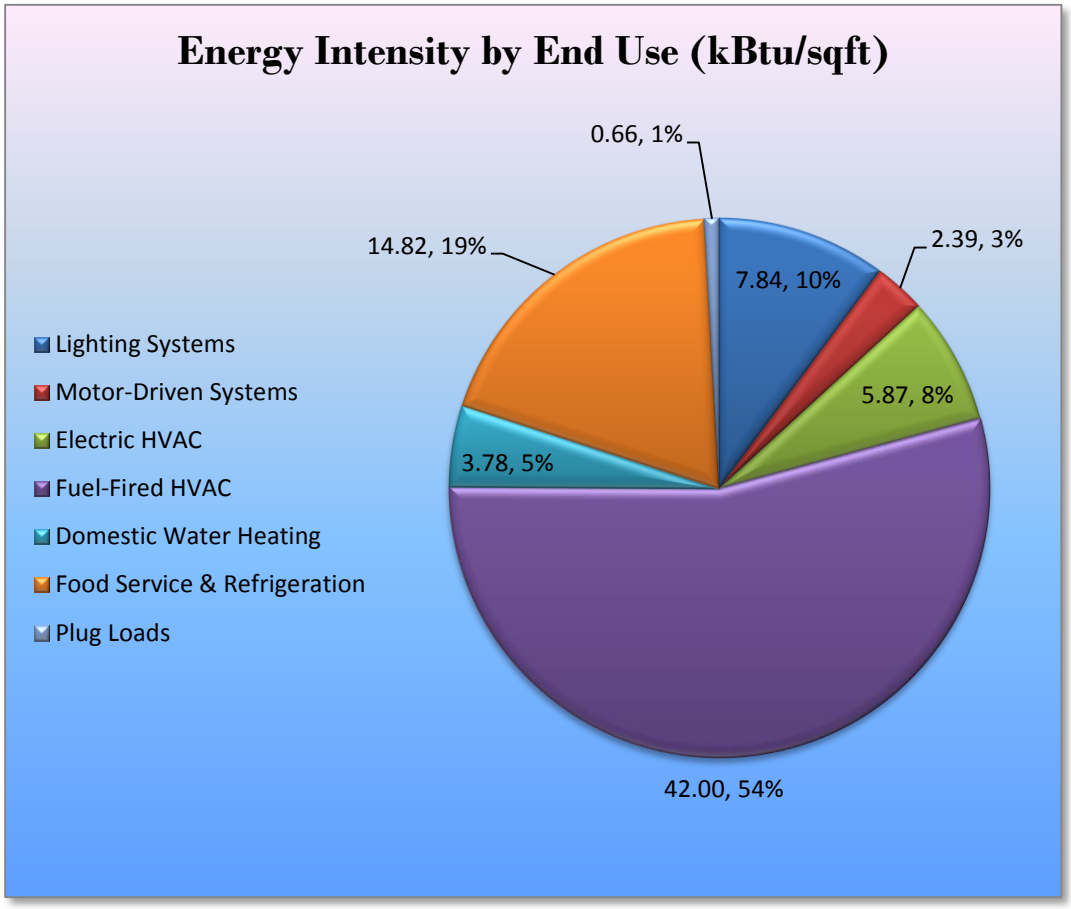
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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 (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 Mystic Island Volunteer Fire Company 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** | | **12,666** | **7.3** | **0.0** | **$2,461.42** | **$15,869.29** | **$1,165.00** | **$14,704.29** | **6.0** | **12,755** |
| ECM 1 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 6,371 | 3.7 | 0.0 | $1,238.18 | $8,837.83 | $510.00 | $8,327.83 | 6.7 | 6,416 |
| ECM 2 | Retrofit Fixtures with LED Lamps | 6,295 | 3.6 | 0.0 | $1,223.24 | $7,031.45 | $655.00 | $6,376.45 | 5.2 | 6,339 |
| **Lighting Control Measures** | | **1,180** | **0.7** | **0.0** | **$229.22** | **$2,412.00** | **$390.00** | **$2,022.00** | **8.8** | **1,188** |
| ECM 3 | Install Occupancy Sensor Lighting Controls | 1,126 | 0.6 | 0.0 | $218.86 | $2,162.00 | $255.00 | $1,907.00 | 8.7 | 1,134 |
| ECM 4 | Install Daylight Dimming Controls | 53 | 0.0 | 0.0 | $10.36 | $250.00 | $135.00 | $115.00 | 11.1 | 54 |
| **Motor Upgrades** | | **499** | **0.1** | **0.0** | **$97.06** | **$536.42** | **$0.00** | **$536.42** | **5.5** | **503** |
| ECM 5 | Premium Efficiency Motors | 499 | 0.1 | 0.0 | $97.06 | $536.42 | $0.00 | $536.42 | 5.5 | 503 |
| **Gas Heating (HVAC/Process) Replacement** | | **0** | **0.0** | **63.6** | **$647.06** | **$11,616.11** | **$2,700.00** | **$8,916.11** | **13.8** | **7,446** |
| ECM 6 | Install High Efficiency Furnaces | 0 | 0.0 | 24.8 | $251.90 | $5,437.76 | $1,200.00 | $4,237.76 | 16.8 | 2,899 |
| ECM 7 | Install Low-Intensity Infrared Heating | 0 | 0.0 | 38.8 | $395.16 | $6,178.35 | $1,500.00 | $4,678.35 | 11.8 | 4,548 |
| **Domestic Water Heating Upgrade** | | **0** | **0.0** | **5.4** | **$54.77** | **$4,456.17** | **$150.00** | **$4,306.17** | **78.6** | **630** |
| ECM 8 | Install Low-Flow Domestic Hot Water Devices | 0 | 0.0 | 0.5 | $5.21 | $7.17 | $0.00 | $7.17 | 1.4 | 60 |
| **Food Service Equipment & Refrigeration Measures** | | **554** | **0.1** | **91.4** | **$1,037.71** | **$19,407.01** | **$975.00** | **$18,432.01** | **17.8** | **11,261** |
| ECM 9 | Food Service Equipment Replacement | 0 | 0.0 | 91.4 | $930.05 | $16,598.81 | $750.00 | $15,848.81 | 17.0 | 10,703 |
| **TOTAL OF ALL RECOMMENDED ECMS** | | **14,345** | **8** | **156** | **$ 4,370.01** | **$ 47,039.79** | **$ 5,005.00** | **$ 42,034.79** | **9.6** | **32,655** |

* - 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 Fixture 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** | | **12,666** | **7.3** | **0.0** | **$2,461.42** | **$15,869.29** | **$1,165.00** | **$14,704.29** | **6.0** | **12,755** |
| ECM 1 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 6,371 | 3.7 | 0.0 | $1,238.18 | $8,837.83 | $510.00 | $8,327.83 | 6.7 | 6,416 |
| ECM 2 | Retrofit Fixtures with LED Lamps | 6,295 | 3.6 | 0.0 | $1,223.24 | $7,031.45 | $655.00 | $6,376.45 | 5.2 | 6,339 |

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: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

*Summary of Measure Economics*

| Interior/ Exterior | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($) | Estimated Net Cost ($) | Simple Payback Period (yrs) | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|
| Interior | 6,371 | 3.7 | 0.0 | $1,238.18 | $8,837.83 | $510.00 | $8,327.83 | 6.7 | 6,416 |
| Exterior | 0 | 0.0 | 0.0 | $0.00 | $0.00 | $0.00 | $0.00 | 0.0 | 0 |

*Measure Description*

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

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

## 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 | 6,249 | 3.6 | 0.0 | $1,214.36 | $6,708.94 | $655.00 | $6,053.94 | 5.0 | 6,293 |
| Exterior | 46 | 0.0 | 0.0 | $8.88 | $322.52 | $0.00 | $322.52 | 36.3 | 46 |

*Measure Description*

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

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

## 4.1.2 Lighting Control Measures

Our recommendations for upgrades to 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** | | **1,180** | **0.7** | **0.0** | **$229.22** | **$2,412.00** | **$390.00** | **$2,022.00** | **8.8** | **1,188** |
| ECM 3 | Install Occupancy Sensor Lighting Controls | 1,126 | 0.6 | 0.0 | $218.86 | $2,162.00 | $255.00 | $1,907.00 | 8.7 | 1,134 |
| ECM 4 | Install Daylight Dimming Controls | 53 | 0.0 | 0.0 | $10.36 | $250.00 | $135.00 | $115.00 | 11.1 | 54 |

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) |
|---|---|---|---|---|---|---|---|---|
| 1,126 | 0.6 | 0.0 | $218.86 | $2,162.00 | $255.00 | $1,907.00 | 8.7 | 1,134 |

*Measure Description*

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in all restrooms, offices areas and assembly hall. 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 Daylight Dimming 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) |
|---|---|---|---|---|---|---|---|---|
| 53 | 0.0 | 0.0 | $10.36 | $250.00 | $135.00 | $115.00 | 11.1 | 54 |

*Measure Description*

We recommend installing daylight dimming controls that use photosensors to reduce electric lighting in areas when ample daylight lighting is present. Photosensor controls are recommended for fixtures that are adjacent to windows that receive lots of sunlight. As sunlight level increase in the room, fixture lighting is decreased or turned off. This measure reduces energy use in spaces where sufficient lighting levels can be met by ambient daylight.

Optimum light levels and the method of dimming should be determined during lighting design. 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.

## 4.1.3 Motor Upgrades

Our recommendations for upgrades to motors are summarized in Figure 18 below.

*Figure 18 – Summary of Motor Upgrades ECM*

| 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** | | **499** | **0.1** | **0.0** | **$97.06** | **$536.42** | **$0.00** | **$536.42** | **5.5** | **503** |
| ECM 5 | Premium Efficiency Motors | 499 | 0.1 | 0.0 | $97.06 | $536.42 | $0.00 | $536.42 | 5.5 | 503 |

### 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) |
|---|---|---|---|---|---|---|---|---|
| 499 | 0.1 | 0.0 | $97.06 | $536.42 | $0.00 | $536.42 | 5.5 | 503 |

*Measure Description*

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

### 4.1.4 Gas-Fired Heating System Replacements

Our recommendations for gas-fired heating system replacements are summarized in Figure 19 below.

*Figure 19 - Summary of Gas-Fired Heating Replacement ECMs*

| Energy Conservation Measure | | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Gas Heating (HVAC/Process) Replacement** | | **0** | **0.0** | **63.6** | **$647.06** | **$11,616.11** | **$2,700.00** | **$8,916.11** | **13.8** | **7,446** |
| ECM 6 | Install High Efficiency Furnaces | 0 | 0.0 | 24.8 | $251.90 | $5,437.76 | $1,200.00 | $4,237.76 | 16.8 | 2,899 |
| ECM 7 | Install Low-Intensity Infrared Heating | 0 | 0.0 | 38.8 | $395.16 | $6,178.35 | $1,500.00 | $4,678.35 | 11.8 | 4,548 |

## ECM 6: Install High Efficiency Furnaces

*Summary of Measure Economics*

| Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($) | Estimated Net Cost ($) | Simple Payback Period (yrs) | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0.0 | 24.8 | $251.90 | $5,437.76 | $1,200.00 | $4,237.76 | 16.8 | 2,899 |

*Measure Description*

We recommend replacing the two existing standard efficiency furnaces with an output capacity of 80 MBh with condensing furnaces. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases which can significantly improve furnace efficiency. Savings result from improved system efficiency.

## ECM 7: Install Low-Intensity Infrared Heating

*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 | 38.8 | $395.16 | $6,178.35 | $1,500.00 | $4,678.35 | 11.8 | 4,548 |

*Measure Description*

We recommend replacing the existing gas-fired, non-condensing hot water boiler with low-intensity (three 30-foot straight tube heaters with an average output capacity of 70 MBh) infrared heating units (the flame is enclosed rather than an open flame on a ceramic or metal surface). Hot water boilers heat all of the air in the space served, which is inefficient for large volume spaces with relatively few occupants, areas with high ceilings, or areas with high outside air infiltration. Infrared heaters heat object surfaces directly, including the occupants of the space, rather than heating large volumes of air. So, occupants feel comfortable, but energy costs are significantly reduced. Infrared heaters also heat the floor which then re-radiates the heat. As a result infrared heaters are more effective and efficient at maintaining occupant comfort for certain space types.

## 4.1.5 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 20 below.

*Figure 20 - 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** | **5.4** | **$54.77** | **$4,456.17** | **$150.00** | **$4,306.17** | **78.6** | **630** |
| ECM 8 | Install Low-Flow Domestic Hot Water Devices | 0 | 0.0 | 0.5 | $5.21 | $7.17 | $0.00 | $7.17 | 1.4 | 60 |

### ECM 8: 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 | 0.5 | $5.21 | $7.17 | $0.00 | $7.17 | 1.4 | 60 |

*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 and low-flow showerheads can reduce hot water usage, relative to standard showerheads and 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.

## 4.1.6 Food Service Equipment & Refrigeration Measures

Our recommendations for food service and refrigeration measures are summarized in Figure 21 below.

*Figure 21 - 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** | | **554** | **0.1** | **91.4** | **$1,037.71** | **$19,407.01** | **$975.00** | **$18,432.01** | **17.8** | **11,261** |
| ECM 9 | Food Service Equipment Replacement | 0 | 0.0 | 91.4 | $930.05 | $16,598.81 | $750.00 | $15,848.81 | 17.0 | 10,703 |

### ECM 9: Food Service Equipment Replacement

*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 | 91.4 | $930.05 | $16,598.81 | $750.00 | $15,848.81 | 17.0 | 10,703 |

*Measure Description*

We recommend replacement of the existing gas-fired burner/cooking range with new high efficiency equipment. Buildings that use a lot of food service equipment are often among the most energy intensive commercial buildings. Energy usage in commercial kitchens is primarily used for cooking and refrigeration. There have been many energy efficiency improvements for cooking, dishwashing, and refrigerated food storage. For more information on improved energy efficiency for food service and storage, see the Food Service Technology Center website at: www.fishnick.com.

## 4.2 ECMs Evaluated But Not Recommended

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

*Figure 22 – Summary of Measures Evaluated, But Not Recommended*

| Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($)* | Estimated Net Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|
| **Electric Unitary HVAC Measures** | **1,600** | **1.5** | **0.0** | **$310.93** | **$13,465.98** | **$828.00** | **$12,637.98** | **40.6** | **1,611** |
| Install High Efficiency Electric AC | 1,600 | 1.5 | 0.0 | $310.93 | $13,465.98 | $828.00 | $12,637.98 | 40.6 | 1,611 |
| **Domestic Water Heating Upgrade** | **0** | **0.0** | **5.4** | **$54.77** | **$4,456.17** | **$150.00** | **$4,306.17** | **78.6** | **630** |
| Install High Efficiency Gas Water Heater | 0 | 0.0 | 4.9 | $49.56 | $4,449.00 | $150.00 | $4,299.00 | 86.7 | 570 |
| **Food Service Equipment & Refrigeration Measures** | **554** | **0.1** | **91.4** | **$1,037.71** | **$19,407.01** | **$975.00** | **$18,432.01** | **17.8** | **11,261** |
| Replace Refrigeration Equipment | 554 | 0.1 | 0.0 | $107.66 | $2,808.20 | $225.00 | $2,583.20 | 24.0 | 558 |
| **TOTAL OF ALL NON-RECOMMENDED ECMS** | **2,154** | **2** | **5** | **$ 468.15** | **$ 20,723.18** | **$ 1,203.00** | **$ 19,520.18** | **41.7** | **2,739** |

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

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

### Install High Efficiency Air Conditioning Units

*Summary of Measure Economics*

| Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated Install Cost ($) | Estimated Incentive ($) | Estimated Net Cost ($) | Simple Payback Period (yrs) | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|
| 1,600 | 1.5 | 0.0 | $310.93 | $13,465.98 | $828.00 | $12,637.98 | 40.6 | 1,611 |

*Measure Description*

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

*Reasons for not Recommending*

While the package units are old, they are still serviceable. The payback associated with replacing the package units would likely exceed their useful life.

## Install High Efficiency Gas Water Heater

*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 | 4.9 | $49.56 | $4,449.00 | $150.00 | $4,299.00 | 86.7 | 570 |

*Measure Description*

We evaluated replacing the existing tank water heater with a high efficiency tank water heater. Improvements in combustion efficiency and reductions in heat losses have improved the overall efficiency of storage water heaters. Energy savings results from using less gas to heat water, due to higher unit efficiency, and fewer run hours to maintain the tank water temperature.

*Reasons for not Recommending*

While the water heater is old, it is still serviceable. The payback associated with replacing the hot water heater would likely exceed its useful life.

## Replace Refrigeration Equipment

*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) |
|---|---|---|---|---|---|---|---|---|
| 554 | 0.1 | 0.0 | $107.66 | $2,808.20 | $225.00 | $2,583.20 | 24.0 | 558 |

*Measure Description*

We evaluated replacing existing the commercial refrigerator and freezer with new ENERGY STAR® high efficiency equipment. There have been many improvements in refrigeration system equipment, operation, and insulation. The energy savings associated with this measure comes from reduced energy usage due to more efficient technology, and reduced cycling times.

*Reasons for not Recommending*

Although a variety of equipment was evaluated for replacement, the payback period upon investing in these equipment changes would likely be longer than the useful life of the equipment. When this equipment is no longer serviceable, we recommend replacement with high efficiency, ENERGY STAR® rated equipment at the time.

# 5 ENERGY EFFICIENT PRACTICES

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

## Perform Proper Lighting Maintenance

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

## 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.

## Clean Evaporator/Condenser Coils on AC Systems

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

## Perform 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.

## Water Conservation

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

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

# 6 On-Site Generation Measures

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

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

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

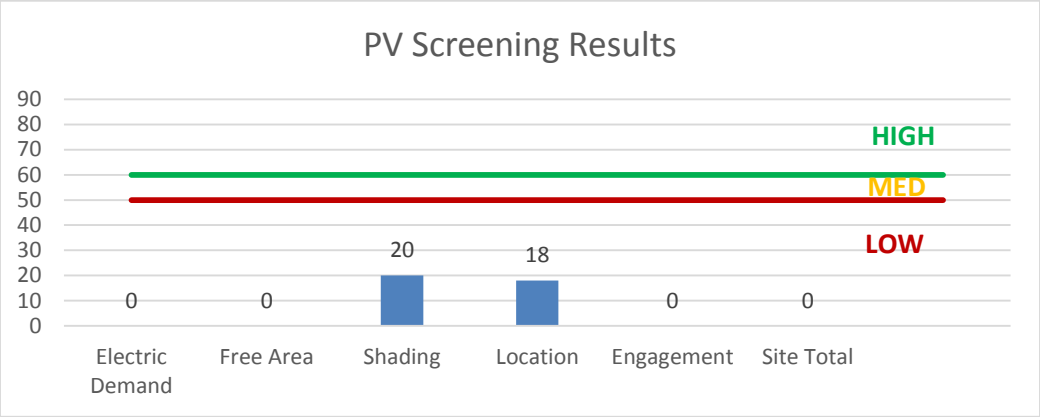
## 6.1 Photovoltaic

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

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

In order to be cost-effective, a solar PV array needs certain minimum criteria, such as flat or south-facing rooftop or other unshaded space on which to place the PV panels. In our opinion, the facility does appear not meet these minimum criteria for cost-effective PV installation.

*Figure 23 - 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

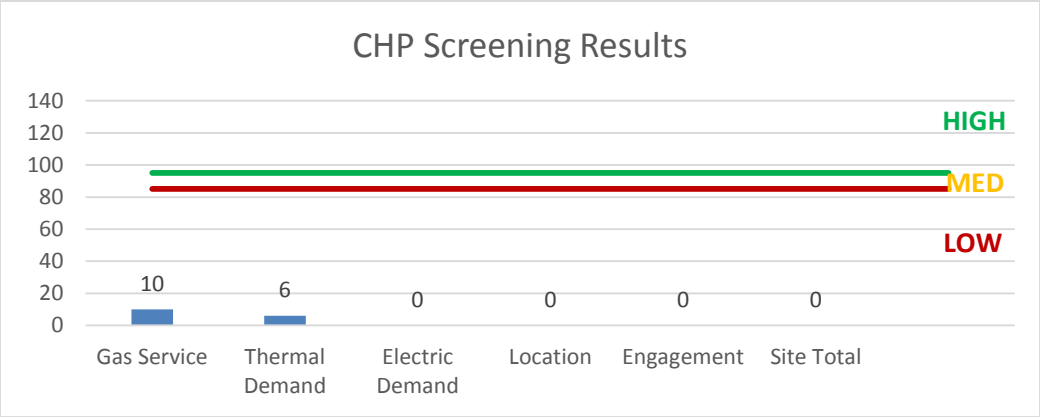
Combined heat and power (CHP) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric 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 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/.](http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/)

*Figure 24 - Combined Heat and Power Screening*



# 7 DEMAND RESPONSE

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

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

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

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

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

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

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

# 8 PROJECT FUNDING / INCENTIVES

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

*Figure 25 - ECM Incentive Program Eligibility*

| Energy Conservation Measure | | SmartStart Prescriptive | Direct Install |
|---|---|---|---|
| ECM 1 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | x | x |
| ECM 2 | Retrofit Fixtures with LED Lamps | x | x |
| ECM 3 | Install Occupancy Sensor Lighting Controls | x | x |
| ECM 4 | Install Daylight Dimming Controls | x | x |
| ECM 5 | Premium Efficiency Motors | x | x |
| ECM 6 | Install High Efficiency Furnaces | x | x |
| ECM 7 | Install Low-Intensity Infrared Heating | | x |
| ECM 8 | Install Low-Flow Domestic Hot Water Devices | | x |
| ECM 9 | Food Service Equipment Replacement | x | 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 Direct Install

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

**Incentives**

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

**How to Participate**

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

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

## 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 |
| Hall | 18 | Linear Fluorescent - T8: 4' T8 (32W) - 4l | Wall Switch | 114 | 1,248 | Relamp | Yes | 18 | LED - Linear Tubes (4) 4' Lamps | Occupancy Sensor | 58 | 874 | 1.07 | 1,863 | 0.0 | $367.08 | $2,750.40 | $430.00 | 5.03 |
| Hall | 6 | Incandescent: Wall mount - 3 lamps | Wall Switch | 180 | 1,248 | Relamp | No | 6 | LED Screw-In Lamps: Wall mount - 3 lamps | Wall Switch | 27 | 1,248 | 0.76 | 1,256 | 0.0 | $251.68 | $1,761.36 | $90.00 | 6.64 |
| Hall | 1 | Incandescent: Chandelier - 6 lamps | Wall Switch | 360 | 1,248 | Relamp | No | 1 | LED Screw-In Lamps: Chandelier - 6 lamps | Wall Switch | 54 | 1,248 | 0.25 | 432 | 0.0 | $85.86 | $587.12 | $30.00 | 6.84 |
| Hall | 9 | Halogen Incandescent: Recessed fixture - 1 lamp | Wall Switch | 90 | 1,248 | Relamp | No | 9 | LED Screw-In Lamps: Recessed fixture - 1 lamp | Wall Switch | 14 | 1,248 | 0.58 | 971 | 0.0 | $192.89 | $990.66 | $45.00 | 4.13 |
| Women restroom | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | 62 | 1,248 | Relamp | Yes | 1 | LED - Linear Tubes (2) 4' Lamps | Occupancy Sensor | 29 | 874 | 0.03 | 59 | 0.0 | $11.43 | $174.50 | $10.00 | 14.39 |
| Women restroom | 8 | Incandescent: Wall mount - 1 lamp | Wall Switch | 100 | 1,248 | Relamp | No | 8 | LED Screw-In Lamps: Wall mount - 1 lamp | Wall Switch | 15 | 1,248 | 0.55 | 959 | 0.0 | $190.56 | $792.87 | $40.00 | 3.99 |
| Hallway | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | 62 | 1,248 | Relamp | No | 1 | LED - Linear Tubes (2) 4' Lamps | Wall Switch | 29 | 1,248 | 0.03 | 47 | 0.0 | $9.04 | $58.50 | $10.00 | 5.36 |
| Men's restroom | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 2L | Wall Switch | 62 | 1,248 | Relamp | Yes | 1 | LED - Linear Tubes (2) 4' Lamps | Occupancy Sensor | 29 | 874 | 0.03 | 59 | 0.0 | $11.43 | $174.50 | $10.00 | 14.39 |
| Boiler room | 1 | Linear Fluorescent: T12: 4' T12 (40W) - 1L | Wall Switch | 176 | 1,248 | Relamp & Reballast | No | 1 | LED - Linear Tubes (4) 4' Lamps | Wall Switch | 60 | 1,210 | 0.00 | 135 | 0.0 | $26.31 | $161.83 | $20.00 | 5.39 |
| Engine room | 21 | Linear Fluorescent - T12: 8' T12 (75W) - 2L | Wall Switch | 158 | 1,248 | Relamp & Reballast | No | 21 | LED - Linear Tubes (2) 8' Lamps | Wall Switch | 72 | 1,248 | 1.47 | 2,547 | 0.0 | $494.94 | $4,242.00 | $0.00 | 8.57 |
| Storage/Maintenance | 1 | Linear Fluorescent - T8: 4' T8 (32W) - 4l | Wall Switch | 114 | 1,248 | Relamp | No | 1 | LED - Linear Tubes (4) 4' Lamps | Wall Switch | 58 | 1,248 | 0.05 | 79 | 0.0 | $15.35 | $95.13 | $20.00 | 4.90 |
| Pickup bay - small | 8 | Linear Fluorescent - T12: 4' T12 (40W) - 2L | Wall Switch | 88 | 1,248 | Relamp & Reballast | No | 8 | LED - Linear Tubes (2) 4' Lamps | Wall Switch | 40 | 1,248 | 0.31 | 542 | 0.0 | $105.24 | $935.00 | $80.00 | 8.13 |
| Radio room | 1 | Linear Fluorescent - T12: 4' T12 (40W) - 2L | Wall Switch | 88 | 1,248 | Relamp & Reballast | Yes | 1 | LED - Linear Tubes (2) 4' Lamps | Occupancy Sensor | 40 | 874 | 0.05 | 85 | 0.0 | $16.44 | $233.00 | $30.00 | 12.35 |
| Radio room out | 1 | Linear Fluorescent: T12: 4' T12 (40W) - 2L | Wall Switch | 88 | 1,248 | Relamp & Reballast | No | 1 | LED - Linear Tubes (2) 4' Lamps | Wall Switch | 40 | 1,210 | 0.01 | 68 | 0.0 | $13.15 | $117.00 | $10.00 | 8.13 |
| Coal closet | 1 | Linear Fluorescent - T12: 4' T12 (40W) - 2L | Wall Switch | 88 | 1,248 | Relamp & Reballast | Yes | 1 | LED - Linear Tubes (2) 4' Lamps | Occupancy Sensor | 40 | 874 | 0.05 | 85 | 0.0 | $16.44 | $233.00 | $30.00 | 12.35 |
| Entrance hall | 1 | Incandescent: Recessed fixture - 4 lamps | Wall Switch | 240 | 1,248 | Relamp | No | 1 | LED Screw-In Lamps: Recessed fixture - 4 lamps | Wall Switch | 36 | 1,248 | 0.17 | 288 | 0.0 | $55.91 | $215.01 | $20.00 | 3.49 |
| Under the stairs storage | 1 | Linear Fluorescent - T12: 4' T12 (40W) - 2L | Wall Switch | 88 | 1,248 | Relamp & Reballast | No | 1 | LED - Linear Tubes (2) 4' Lamps | Wall Switch | 40 | 1,248 | 0.04 | 68 | 0.0 | $13.15 | $117.00 | $10.00 | 8.13 |
| Kitchen | 4 | Linear Fluorescent - T12: 4' T12 (40W) - 2L | Wall Switch | 88 | 1,248 | Relamp & Reballast | Yes | 1 | LED - Linear Tubes (2) 4' Lamps | Occupancy Sensor | 40 | 874 | 0.26 | 457 | 0.0 | $88.79 | $387.00 | $45.00 | 3.85 |
| Stairwell | 1 | Halogen Incandescent: Recessed fixture - 1 lamp | Wall Switch | 90 | 1,248 | Relamp | No | 1 | LED Screw-In Lamps: Recessed fixture - 1 lamp | Wall Switch | 15 | 1,210 | 0.21 | 123 | 0.0 | $32.22 | $391.11 | $20.00 | 1.52 |
| Office | 2 | Linear Fluorescent - T12: 4' T12 (40W) - 4L | Wall Switch | 176 | 1,248 | Relamp & Reballast | Yes | 2 | LED - Linear Tubes (4) 4' Lamps | Occupancy Sensor | 80 | 874 | 0.20 | 336 | 0.0 | $65.77 | $439.67 | $60.00 | 5.77 |
| Upstairs kitchen and lounge | 12 | Linear Fluorescent - T12: 4' T12 (40W) - 4l | Wall Switch | 176 | 1,248 | Relamp & Reballast | Yes | 12 | LED - Linear Tubes (4) 4' Lamps | Occupancy Sensor | 80 | 874 | 1.17 | 2,031 | 0.0 | $394.64 | $2,462.00 | $310.00 | 5.50 |
| Upstairs kitchen and lounge | 8 | Compact Fluorescent: Recessed fixture - 1 lamp | Wall Switch | 26 | 1,248 | Relamp | No | 2 | LED Screw-In Lamps: Recessed fixture - 1 lamp | Wall Switch | 18 | 1,248 | 0.14 | 242 | 0.0 | $47.03 | $107.51 | $0.00 | 2.29 |
| Restroom | 2 | Linear Fluorescent - T12: 4' T12 (40W) - 4L | Wall Switch | 176 | 1,248 | Relamp & Reballast | Yes | 2 | LED - Linear Tubes (4) 4' Lamps | Occupancy Sensor | 80 | 874 | 0.20 | 336 | 0.0 | $65.77 | $439.67 | $40.00 | 6.08 |
| Office | 2 | Linear Fluorescent: T12: 4' T12 (40W) - 1L | Wall Switch | 176 | 1,248 | Relamp & Reballast | Yes | 2 | LED - Linear Tubes (4) 4' Lamps | Occupancy Sensor | 80 | 874 | 0.20 | 336 | 0.0 | $65.77 | $439.67 | $60.00 | 5.77 |
| All building | 8 | Exit Signs: LED - 2 W Lamp | None | 6 | 8,760 | None | No | 8 | 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 |
| Exterior canopy | 3 | Compact Fluorescent Canopy fixture - 2 lamps | Wall Switch | 36 | 1,248 | Relamp | Yes | 3 | LED Screw-In Lamps Canopy fixture - 2 lamps | Daylight Dimming | 25 | 624 | 0.06 | 99 | 0.0 | $19.24 | $672.52 | $135.00 | 22.74 |

## 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 |
| Grounds | Hall | 4 | Supply Fan | 0.3 | 60.0% | No | 1,127 | No | 60.0% | No | | 0.00 | 0 | 0.0 | $0.00 | $0.00 | $0.00 | 0.00 |
| Engine bay | Hoist doors | 1 | Other | 0.5 | 60.0% | No | 104 | No | 60.0% | No | | 0.00 | 0 | 0.0 | $0.00 | $0.00 | $0.00 | 0.00 |
| Engine bay | Hoist doors | 3 | Other | 0.5 | 60.0% | No | 104 | No | 60.0% | No | | 0.00 | 0 | 0.0 | $0.00 | $0.00 | $0.00 | 0.00 |
| Attic | Furnace | 4 | Supply Fan | 0.8 | 60.0% | No | 700 | No | 60.0% | No | | 0.00 | 0 | 0.0 | $0.00 | $0.00 | $0.00 | 0.00 |
| Boiler room | Boiler | 1 | Heating Hot Water Pump | 0.8 | 60.0% | No | 2,745 | Yes | 81.1% | No | | 0.13 | 499 | 0.0 | $97.06 | $536.42 | $0.00 | 5.53 |
| Engine bay | Fire engine | 1 | Air Compressor | 15.0 | 92.4% | No | 52 | No | 92.4% | 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 |
| Grounds | Hall | 1 | Split System AC | 5.00 | | Yes | 1 | Split System AC | 5.00 | | 14.00 | | No | 0.85 | 889 | 0.0 | $122.74 | $7,481.10 | $460.00 | 40.65 |
| Grounds | Hall | 1 | Split System AC | 5.00 | | No | | | | | | | No | 0.00 | 0 | 0.0 | $0.00 | $0.00 | $0.00 | 0.00 |
| Grounds | Upstairs | 1 | Split System AC | 4.00 | | Yes | 1 | Split System AC | 4.00 | | 14.00 | | No | 0.68 | 711 | 0.0 | $138.19 | $5,984.88 | $368.00 | 40.65 |

## Fuel Heating Inventory & Recommendations

| | | Existing Conditions | | | Proposed Conditions | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Served | System Quantity | System Type | Output Capacity per Unit (MBh) | Install High Efficiency System? | System Quantity | System Type | Output Capacity per Unit (MBh) | Heating Efficiency | Heating Efficiency Units | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Boiler room | Engine space | 1 | Non-Condensing Hot Water Boiler | 208.00 | Yes | 3 | Infrared Unit Heater | 70.00 | 93.00% | Et | 0.00 | 0 | 38.8 | $395.16 | $6,178.35 | $1,500.00 | 11.84 |
| Attic | Hall and kitchen | 2 | Furnace | 80.00 | Yes | 2 | Furnace | 80.00 | 95.00% | AFUE | 0.00 | 0 | 17.7 | $179.93 | $3,625.17 | $800.00 | 15.70 |
| Attic | Upstairs area | 1 | Furnace | 80.00 | Yes | 1 | Furnace | 80.00 | 95.00% | AFUE | 0.00 | 0 | 7.1 | $71.97 | $1,812.59 | $400.00 | 19.63 |

## DHW Inventory & Recommendations

| | | Existing Conditions | | Proposed Conditions | | | | | | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Area(s)/System(s) Served | System Quantity | System Type | Replace? | System Quantity | System Type | Fuel Type | System Efficiency | Efficiency Units | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Boiler room | All building | 1 | Storage Tank Water Heater (> 50 Gal) | Yes | 1 | Storage Tank Water Heater (> 50 Gal) | Natural Gas | 93.00% | EF | 0.00 | 0 | 4.9 | $49.56 | $4,449.00 | $150.00 | 86.74 |

## 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 |
| Kitchen | 1 | Faucet Aerator (Kitchen) | 2.50 | 2.20 | 0.00 | 0 | 0.5 | $5.21 | $7.17 | $0.00 | 1.38 |

## Commercial Refrigerator/Freezer Inventory & Recommendations

| | Existing Conditions | | | Proposed Condi | Energy Impact & Financial Analysis | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Quantity | Refrigerator/ Freezer Type | ENERGY STAR Qualified? | Install ENERGY STAR Equipment? | Total Peak kW Savings | Total Annual kWh Savings | Total Annual MMBtu Savings | Total Annual Energy Cost Savings | Total Installation Cost | Total Incentives | Simple Payback w/ Incentives in Years |
| Kitchen | 1 | Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.) | No | Yes | 0.05 | 415 | 0.0 | $80.71 | $1,299.20 | $75.00 | 15.17 |
| Kitchen | 1 | Stand-Up Freezer, Solid Door (16 - 30 cu. ft.) | No | Yes | 0.02 | 139 | 0.0 | $26.95 | $1,509.00 | $150.00 | 50.42 |

## 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 |
| Kitchen and Engine room | 2 | Ice Making Head (<450 lbs/day), Batch | 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 |
| Kitchen | 1 | Gas Combination Oven/Steam Cooker (<15 Pans) | No | Yes | 0.00 | 0 | 91.4 | $930.05 | $16,598.81 | $750.00 | 17.04 |

## Plug Load Inventory

| | Existing Conditions | | | |
|---|---|---|---|---|
| Location | Quantity | Equipment Description | Energy Rate (W) | ENERGY STAR Qualified? |
| Mystic Island Fire Co | 2 | Computers | 150.0 | Yes |
| Mystic Island Fire Co | 3 | Printer - small | 20.0 | Yes |
| Mystic Island Fire Co | 2 | Printer - medium | 60.0 | Yes |
| Mystic Island Fire Co | 1 | Paper shredder | 150.0 | Yes |
| Mystic Island Fire Co | 1 | Microwave | 900.0 | Yes |
| Mystic Island Fire Co | 1 | Refrigerator - Large | 200.0 | Yes |
| Mystic Island Fire Co | 1 | Refrigerator - double door | 218.0 | Yes |
| Mystic Island Fire Co | 2 | Television - LED | 80.0 | Yes |
| Mystic Island Fire Co | 1 | Ice Machine | 300.0 | Yes |

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

## ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

**N/A**

ENERGY STAR® Score[1]

### Mystic Island Vol Fire Company

**Primary Property Type:** Fire Station
**Gross Floor Area (ft²):** 8,000
**Built:** 1974

**For Year Ending:** March 31, 2017
**Date Generated:** January 13, 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 |
|---|---|---|
| Mystic Island Vol Fire Company<br>827A Radio Road<br>Little Egg Harbor, New Jersey 08087 | Mystic Island Vol Fire Company<br>827 A Radio Road<br>Little Egg Harbor, NJ 08087<br>609-713-1113 | Jeffrey Petrauskas<br>827 A Radio Road<br>Little Egg Harbor, NJ 08087<br>609-713-1113<br>jeffrey.petrauskas@gmail.com |

**Property ID:** 6195935

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

**Site EUI**
75.5 kBtu/ft²

**Source EUI**
125.3 kBtu/ft²

| Annual Energy by Fuel | |
|---|---|
| Electric - Grid (kBtu) | 175,838 (29%) |
| Natural Gas (kBtu) | 428,487 (71%) |

| National Median Comparison | |
|---|---|
| National Median Site EUI (kBtu/ft²) | 93.1 |
| National Median Source EUI (kBtu/ft²) | 154.4 |
| % Diff from National Median Source EUI | -19% |
| **Annual Emissions** | |
| Greenhouse Gas Emissions (Metric Tons CO2e/year) | 42 |

### 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)**