Local Government Energy Audit:
Energy Audit Report

Little Egg Harbor District Offices

Little Egg Harbor School District
307 Frog Pond Road
Little Egg Harbor, NJ 08087

September 21, 2017

Report by:
TRC Energy Services

Disclaimer

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

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

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

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

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1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Little Egg Harbor District Offices.

The goal of an LGEA audit is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your facility's energy usage, and put your facility in a position to implement ECMs. The LGEA program also provides customers with valuable information on how to receive financial incentives for implementing the ECMs from New Jersey's Clean Energy Programs (NJCEP).

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey public schools (and other public facilities) in controlling energy costs and protecting our environment by offering information and assistance for a wide range of energy management options.

1.1 Facility Summary

Little Egg Harbor District Office Building (a.k.a. the Joan C. Bard Administration Building) is a 4,000 square foot single-story building comprised of administrative offices and conference rooms for the Little Egg Harbor Board of Education. The facility operates year round during normal business hours. The building is typically occupied by 15 staff members.

The facility was constructed in 1998. It is a long rectangular slab on grade building with vinyl siding and a stone façade in the front. It has a sloped tiled roof and aluminum framed double-paned windows. The Little Egg Harbor District Office is less than 20 years old and, therefore, already meets modern commercial building code energy efficiency standards. By modern standards, the building is fairly energy efficient. Lighting is primarily comprised by T8 fluorescent fixtures. The HVAC equipment and building envelope are in good condition.

However, advances in new lighting technology and availability of new high-efficiency air conditioning units offer the facility opportunities for additional energy savings. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC recommends five (5) measures, which together represent an opportunity for Little Egg Harbor District Offices to reduce annual energy costs by roughly $7,248 and annual greenhouse gas emissions by 35,996 lbs CO_2e. We estimate that the recommended measures would pay for themselves in energy savings in just over four (4) years. The breakdown of existing and potential utility costs is shown in Figure 1 and Figure 2, respectively. These projects represent an opportunity to reduce Little Egg Harbor District Office's annual energy use by 29.2%.

Figure 1 – Previous 12 Month Utility Costs

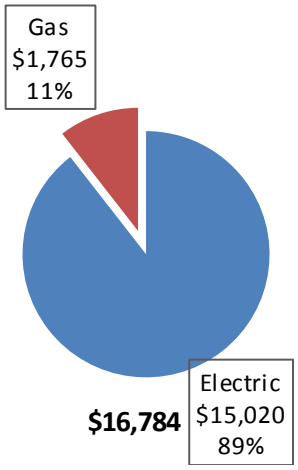
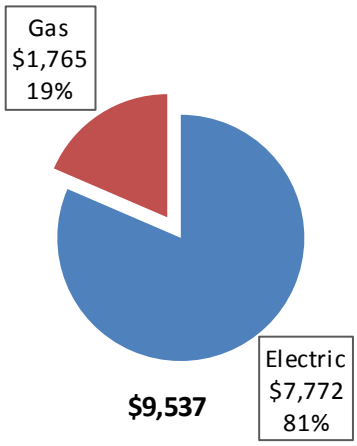


Figure 2 – Potential Post-Implementation Costs



A detailed description of Little Egg Harbor District Office's existing energy use can be found in Section 3.

The recommended measures are listed and grouped by category in Figure 3. Brief descriptions of the categories can be found below and descriptions of the individual measures 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			**30,763**	**8.6**	**0.0**	**$6,237.53**	**$18,902.77**	**$3,260.00**	**$15,642.77**	**2.51**	**30,979**
ECM 1	Install LED Fixtures	Yes	25,380	5.9	0.0	$5,146.08	$12,837.91	$2,300.00	$10,537.91	2.05	25,558
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	519	0.4	0.0	$105.33	$990.06	$60.00	$930.06	8.83	523
ECM 3	Retrofit Fixtures with LED Lamps	Yes	4,864	2.4	0.0	$986.12	$5,074.80	$900.00	$4,174.80	4.23	4,898
Lighting Control Measures			**1,202**	**0.6**	**0.0**	**$243.69**	**$2,934.00**	**$425.00**	**$2,509.00**	**10.30**	**1,210**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	1,202	0.6	0.0	$243.69	$2,934.00	$425.00	$2,509.00	10.30	1,210
Electric Unitary HVAC Measures			**3,780**	**2.9**	**0.0**	**$766.48**	**$11,969.76**	**$736.00**	**$11,233.76**	**14.66**	**3,807**
ECM 5	Install High Efficiency Electric AC	Yes	3,780	2.9	0.0	$766.48	$11,969.76	$736.00	$11,233.76	14.66	3,807
TOTALS			**35,746**	**12.1**	**0.0**	**$7,247.70**	**$33,806.53**	**$4,421.00**	**$29,385.53**	**4.05**	**35,996**

* - 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). $0.20

Lighting Upgrades 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 involve the installation of automated controls to turn off lights or reduce light output when conditions allow. Automated control reduces reliance on occupant behavior for adjusting lights. These measures save energy by reducing the amount of time lights are on.

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

condition systems, but use less energy. These measures save energy by reducing the power used by the air condition system due to improved electrical efficiency.

Energy Efficient Practices

TRC also identified four no- (or low–cost) energy efficient practices. A facility can significantly improve energy performance by employing behavioral and operational adjustments, as well as performing routine maintenance on building systems. Through these practices, equipment lifetime can be extended; occupant comfort, health, and safety can be improved; and annual energy, operation, and maintenance costs can be reduced. Opportunities identified at Little Egg Harbor District Offices include:

- Close Doors and Windows
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Clean Evaporator/Condenser Coils on Air Conditioning (AC) Systems
- Clean and/or Replace HVAC Filters

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 Little Egg Harbor District Offices. Based on the configuration of the site and its electric load, the potential for installing a solar PV system is not ideal. Though the rooftop has no obstructions that might shade solar panels, it is not very large, nor is it ideally oriented for solar generation. Ideally a solar project should have a large flat rooftop or southward facing rooftop. The District Office is a small building with east-west sloping roof. Orientation of panels to the south might be possible, with the proper racking system, but that would increase the cost and the weight of the system.

The adjacent building (Frog Pond Elementary School), has a solar PV array installed on its rooftop and it has additional room for expansion. We suggest that it would likely be more cost effective for the School District to expand generating capacity adjacent building first, rather than install a small array on the District Office Building. If the School District is interested in expanding its current solar power generation Frog Pond Elementary then it might be cost effective to add PV panels on the rooftop of the District Office as well at, if it were part of a much large system. Otherwise, it is probably too small to be economically feasible.

For details on our evaluation and the self-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 should be developed. Available capital should be considered and decisions will need to be made whether it is best to pursue individual ECMs separately, groups of ECMs together, or a more comprehensive approach where all ECMs are implemented at the same time, possibly in conjunction with other facility upgrades or combined with upgrades to other buildings.

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 represent the SmartStart program and will be explained further in Section 7, as well as the other programs as mentioned below.

This facility also qualifies for the Direct Install program which, through an authorized network of participating contractors, can assist with the implementation of a group of measures versus installing individual measures or phasing implementation. This program is designed to be turnkey and will provide an incentive up to 70% of the cost of the project identified by the designated contractor.

For facilities without capital available 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 external project development, design, and implementation services as well as financing for implementing ECMs. This LGEA report is the first step for participating in ESIP and should help you determine next steps. Refer to Section 7 3 for additional information on the ESIP Program.

Additional descriptions of all relevant incentive programs are located in Section 7 or www.njcleanenergy.com/ci.

2 Facility Information and Existing Conditions

2.1 Project Contacts

Figure 4 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Katrina M. Reigelman	Energy Manager	treigelman@lehsd.k12.nj.us	(609) 709-8316
TRC Energy Services			
Tom Page	Auditor	TPage@TRCsolutions.com	(732) 855-0033

2.2 General Site Information

On September 27, 2016, TRC performed an energy audit at Little Egg Harbor District Offices located in Little Egg Harbor, New Jersey. TRCs' team met with Katrina Reigelman, Steve Hillman, and Seth Cole to review the facility operations and focus the investigation on specific energy-using systems.

Constructed in 1998, the Little Egg Harbor District Office Building (a.k.a. the Joan C. Bard Administration Building), is a 4,000 square foot single-story building comprised of administrative offices and conference rooms for the Little Egg Harbor Board of Education. It is a long, rectangular slab on grade building with vinyl siding and a stone façade in the front. It has a sloped tiled roof and aluminum framed double-paned windows. The Little Egg Harbor District Office is less than 20 years old and, therefore, is generally in compliance with modern commercial building energy efficiency standards. The lighting is primarily comprised of T8 fluorescent fixtures. The HVAC equipment and building envelope are in generally good condition. However, advances in new lighting technology and new high-efficiency air conditioning units offer the facility opportunities for additional energy savings.

2.3 Building Occupancy

The facility operates year-round during normal business hours. The building is typically occupied by 15 staff members. The typical schedule is presented in the table below.

Figure 5 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Little Egg Harbor District Offices	Weekday	8:00 AM - 6:00 PM
Little Egg Harbor District Offices	Weekend	NONE

2.4 Building Envelope

The facility is a long rectangular, slab on grade building with vinyl siding and a stone façade in the front. It has a sloped tiled roof and aluminum framed windows and doors. The windows are all thermally-insulated double-paned. No air infiltration was evident during our inspection. The window and door seals all seemed fairly tight and no occupant comfort issues were noted.

Door & Window Seals Appeared in Generally Good Condition

2.5 On-site Generation

Little Egg Harbor District Office has no on-site electric generation capacity. However, the building next door, the George Mitchell Elementary School, has a 28-kW solar PV array that was installed in 2009.

2.6 Energy-Using Systems

Please refer to Appendix A: Equipment Inventory & Recommendations for an inventory of your equipment.

Lighting System

Lighting at the facility is mostly provided by linear 32-watt fluorescent T8 lamps with electronic ballasts. There are also some incandescent fixtures used for exterior lighting. One new exterior LED wall pack was recently installed. The parking lot is lit by 400-watt pole-mount metal halide fixtures.

Lighting control is provided throughout by manual switches. The exterior fixtures are believed to be controlled by timers, but the precise hourly settings were not known.

TRC recommends that the facility's lighting be retrofitted with new high-efficiency LED technology. New LED fixtures and tubes are available to cost-effectively retrofit all of the fixture types observed at the facility. We also recommend adding occupancy sensors to most interior spaces to provide additional energy savings.

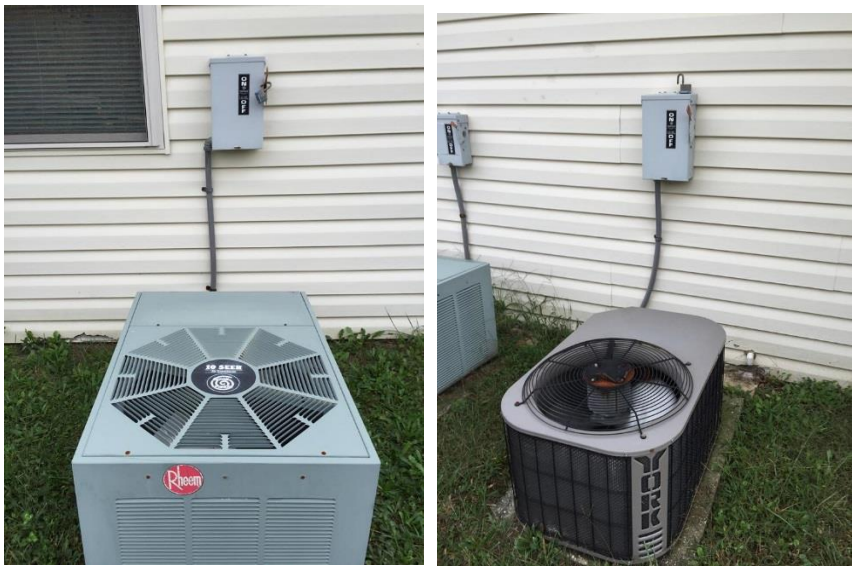
Exterior Lighting Fixtures

Heating Ventilation and Air Conditioning (HVAC)

Cooling at the facility is provided by four (4) split system air conditioning units - three (3) manufactured by Rheem and one (1) by York. The capacity of each was estimated to be 24,000 BTUH, an estimated total of eight (8) tons of cooling for the building.

The four (4) AC units are believed to have been installed when the building was built in 1998. They appeared to be in fair condition, with a seasonal energy efficiency rating (SEER) = 10.0. Today, most standard efficiency new units of this type are usually rated at 12 to 13 SEER. High-efficiency replacement units (by York or Rheem) are now available with efficiencies of 18 or 20 SEER. Replacement of the existing units with a new high-efficiency unit would likely be a cost-effective energy efficiency upgrade.

Split System Air Conditioning Units



Gas-fired heating is provided to the space with an estimated input capacity of 134,000 BTUH (based on the gas bills provided). The furnace make and model could not be verified while on site. The furnace is also believed to be original to the building. No upgrade is recommended for the heating system.

Domestic Hot Water

The domestic hot water needs of the facility are very minimal. How water is used for only two restrooms. We did not have access to the hot water heater while onsite, but the restrooms are believed to be supplied by a single hot water heater with a capacity of approximately 40 gallons.

Refrigeration

One refrigerator was observed on site. The size was approximately 25 cu. ft. No refrigeration measures are recommended.

Plug Load Appliances and Office Equipment

Plug load & Vending Machines

The plug load demand of the administration building is minimal, just general office equipment with eight (8) computer work stations and multiple printers, copiers, and TVs. No plug load measures are recommended.

2.7 Water-Using Systems

There are just two (2) restrooms at this facility. All toilets and faucets were observed to meet current water conservation standards for low-flow.

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 Section3.4 for additional information.

3.1 Total Cost of Energy

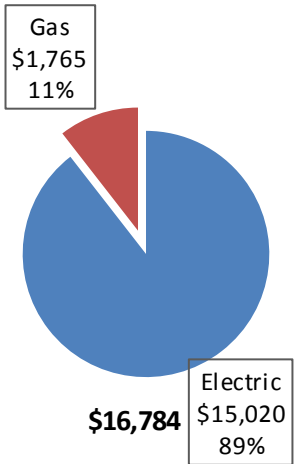
The following energy consumption and cost data are based on the last 12-month period of utility usage data that was provided for each utility. The annual consumption and cost were developed from this information.

Figure 6 - Utility Summary

Utility Summary for Little Egg Harbor District Offices		
Fuel	**Usage**	**Cost**
Electricity	74,077 kWh	$15,020
Natural Gas	1,649 Therms	$1,765
Total		**$16,784**

The current utility cost for this site is $16,784 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 for the past 12 months is $0.203 per kWh. This is the blended rate, which includes all, usage, transmission, and distribution charges. This rate is used throughout the analyses in this report. The monthly electricity consumption and peak demand are represented graphically in the chart below.

Figure 8 Electric Usage & Demand

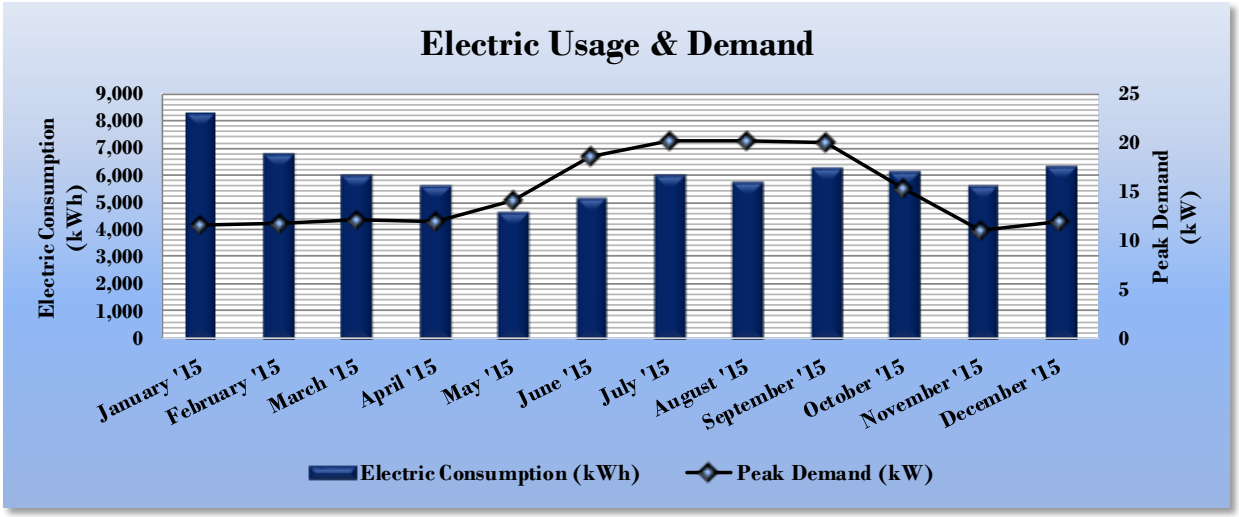


Figure 9 - Electric Usage & Demand

Electric Billing Data for Little Egg Harbor District Offices				
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Total Electric Cost
1/22/15	37	8,303	12	$1,516
2/23/15	31	6,790	12	$1,011
3/23/15	27	6,018	12	$1,144
4/22/15	29	5,625	12	$1,137
5/20/15	27	4,672	14	$989
6/22/15	32	5,202	19	$1,168
7/24/15	31	6,066	20	$1,350
8/24/15	30	5,751	20	$1,572
9/23/15	29	6,284	20	$1,311
10/22/15	28	6,147	15	$1,251
11/19/15	27	5,626	11	$1,103
12/21/15	31	6,375	12	$1,221
Totals	**359**	**72,859**	**20.2**	**$14,773**
Annual	**365**	**74,077**	**20.2**	**$15,020**

3.3 Natural Gas Usage

Natural Gas is provided by New Jersey Natural Gas. The average gas cost for the past 12 months is $1.07 per therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is represented graphically in the chart below.

Figure 10 - Natural Gas Usage

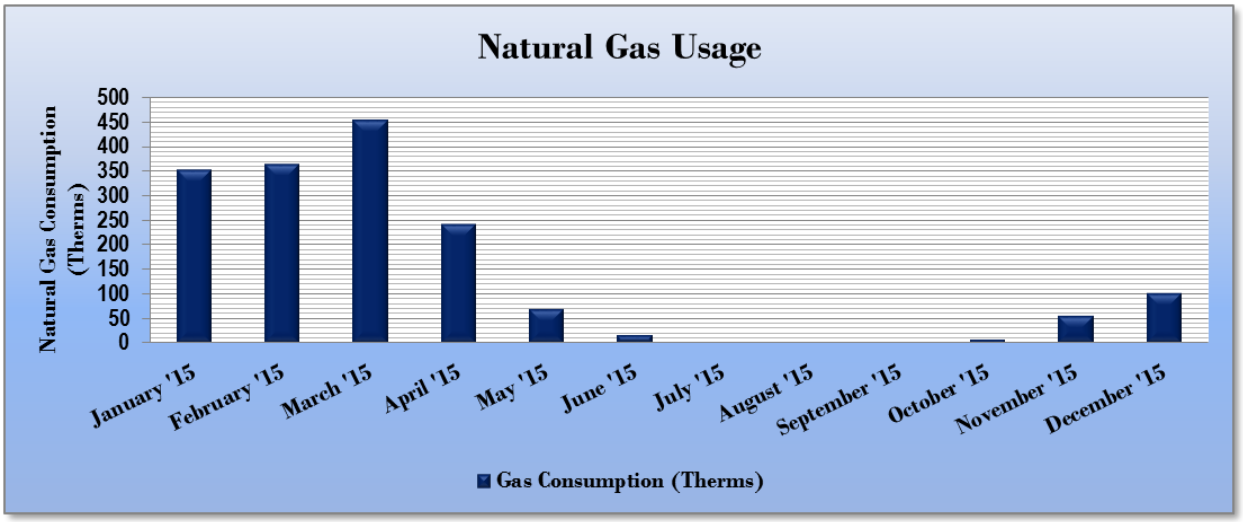


Figure 11 - Natural Gas Usage

Gas Billing Data for Little Egg Harbor District Offices			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
1/14/15	33	351	$344
2/11/15	28	364	$356
3/16/15	33	454	$443
4/14/15	29	241	$245
5/13/15	29	69	$88
6/13/15	31	15	$38
7/14/15	31	0	$25
8/11/15	28	1	$26
9/10/15	30	0	$25
10/13/15	33	6	$31
11/12/15	30	54	$66
12/14/15	32	102	$87
Totals	**367**	**1,658**	**$1,774**
Annual	**365**	**1,649**	**$1,765**

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		
	Little Egg Harbor District Offices	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	241.7	148.1
Site Energy Use Intensity (kBtu/ft^2)	104.4	67.3

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

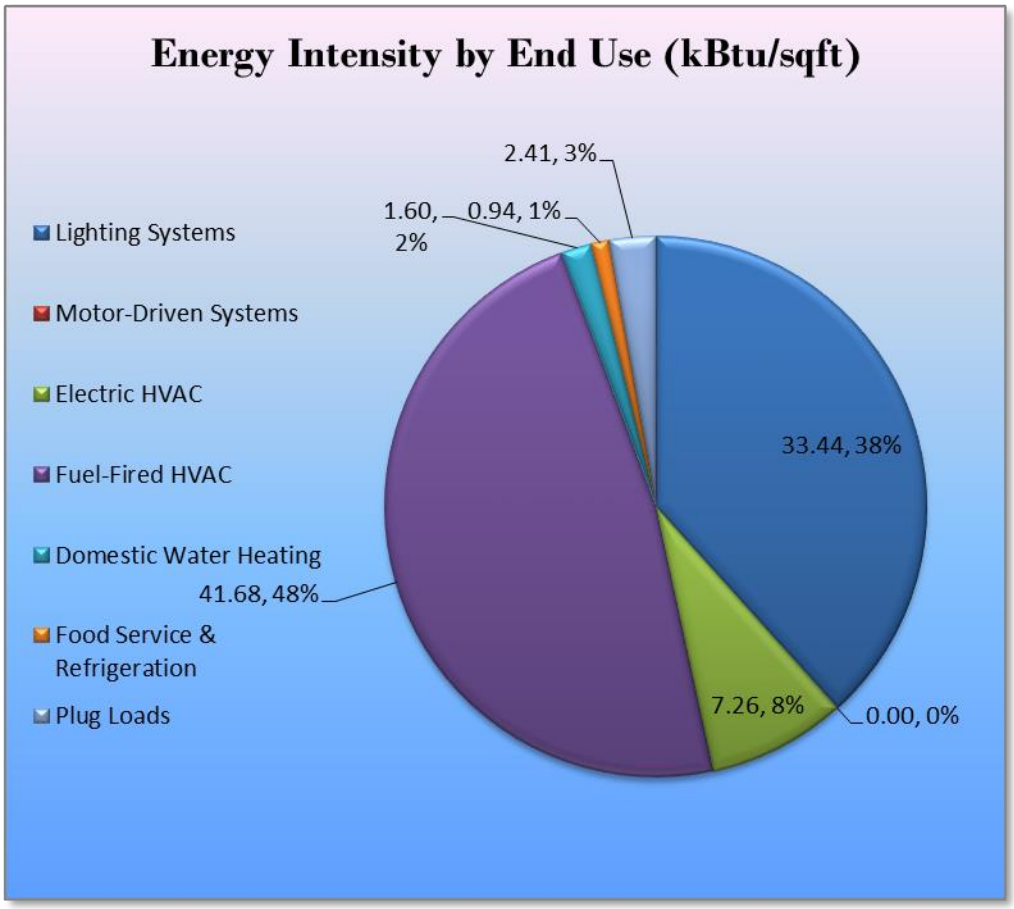
Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Little Egg Harbor District Offices	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	146.0	148.1
Site Energy Use Intensity (kBtu/ft^2)	73.9	67.3

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 percent 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 currently eligible to receive an Energy Star score. However, a Portfolio Manager "Statement of Energy Performance" was developed for this site and can be found in Appendix B: ENERGY STAR® Statement of Energy Performance.

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 and determine their proportional contribution to overall building energy usage. This visual representation of energy end uses highlights systems that may benefit most from energy efficiency projects.

Figure 14 - Energy Balance (% and kBtu/sq.ft.)



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 Municipal Courthouse 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 Section7.

The following sections describe the recommended 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		**30,763**	**8.6**	**0.0**	**$6,237.53**	**$18,902.77**	**$3,260.00**	**$15,642.77**	**2.51**	**30,979**
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* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

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

4.1.1 Lighting Upgrades

Recommended Lighting Upgrades are summarized in Figure 16 below.

Figure 16 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**30,763**	**8.6**	**0.0**	**$6,237.53**	**$18,902.77**	**$3,260.00**	**$15,642.77**	**2.51**	**30,979**
ECM 1	Install LED Fixtures	25,380	5.9	0.0	$5,146.08	$12,837.91	$2,300.00	$10,537.91	2.05	25,558
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	519	0.4	0.0	$105.33	$990.06	$60.00	$930.06	8.83	523
ECM 3	Retrofit Fixtures with LED Lamps	4,864	2.4	0.0	$986.12	$5,074.80	$900.00	$4,174.80	4.23	4,898

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	0
Exterior	25,380	5.9	0.0	$5,146.08	$12,837.91	$2,300.00	$10,537.91	2.05	25,558

Measure Description

We recommend replacing the exterior pole lighting in the parking lot with LED fixtures. The box type pole mounted lights may be directly replaced with new fixtures (or, if it is less expensive retrofitted with new LED bulb kits designed to fit in existing fixtures) in place of the metal halides there currently. LEDs use about half of as much power as most other lighting technologies and provide comparable or better light output.

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

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	519	0.4	0.0	$105.33	$990.06	$60.00	$930.06	8.83	523
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	0

Measure Description

We recommend retrofitting existing fluorescent fixtures by removing fluorescent tubes and ballasts and replacing them with LEDs (and LED drivers, if necessary), which are designed to be used in 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 light output for the space.

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

ECM 3: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	3,828	2.1	0.0	$776.23	$4,656.24	$900.00	$3,756.24	4.84	3,855
Exterior	1,035	0.2	0.0	$209.89	$418.56	$0.00	$418.56	1.99	1,042

Measure Description

We recommend retrofitting the Interior and exterior recessed can lights with LED retrofit kits. Other exterior lighting around the perimeter of the building can also be cost-effectively upgraded with LED bulbs (or replaced with LED exterior fixtures, if less expensive). This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output.

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

4.1.2 Lighting Control Measures

Recommended lighting control measures 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		**1,202**	**0.6**	**0.0**	**$243.69**	**$2,934.00**	**$425.00**	**$2,509.00**	**10.30**	**1,210**
ECM 4	Install Occupancy Sensor Lighting Controls	1,202	0.6	0.0	$243.69	$2,934.00	$425.00	$2,509.00	10.30	1,210

ECM 4: Install Occupancy Sensor Lighting Controls

Measure Description

We recommend installing occupancy sensors to control light fixtures that are currently manually controlled in restrooms, storage rooms, and private offices. Sensors detect occupancy using ultrasonic and/or infrared wave technologies. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Occupants will also be able to manually turn off fixtures. Energy savings result 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. Ceiling-mounted or remote-mounted sensors require the use of low voltage switching relays or a wireless signal to the switch. In general, use wall switch replacement sensors for single occupant offices and other small rooms. Install ceiling-mounted or remote mounted sensors in locations without local switching, in situations where the existing wall switches are not in the line-of-sight of the main work area, and in large spaces. We recommend a holistic design approach that considers both the technology of the lighting sources and how they are controlled.

Maintenance savings are anticipated due to reduced lamp operation, however, additional maintenance costs may be incurred because the occupancy sensors may require periodic adjustment; it is anticipated that the net effect on maintenance costs will be negligible.

4.1.3 Electric Unitary HVAC Measures

Recommended HVAC measures are summarized in Figure 18 below.

Figure 18 - Summary of Unitary HVAC ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**3,780**	**2.9**	**0.0**	**$766.48**	**$11,969.76**	**$736.00**	**$11,233.76**	**14.66**	**3,807**
ECM 5	Install High Efficiency Electric AC	3,780	2.9	0.0	$766.48	$11,969.76	$736.00	$11,233.76	14.66	3,807

ECM 5: Install High-Efficiency Electric AC

Measure Description

We recommend replacing split system air conditioning units with high-efficiency package air conditioners. There have been significant improvements in both compressor and fan motor efficiencies in the past several years. Therefore, electricity savings can be achieved by replacing old 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 old and new unit, the cooling load, and the annual operating hours.

Current units have an efficiency rating of SEER =10.0. Similar high-efficiency units on the market have SEER ratings as high as SEER = 20.0. For this analysis, we assumed the new units would be SEER = 18.0.

5 Energy Efficient Practices

In addition to the quantifiable savings estimated in Section 4, a facility's energy performance can also be improved through the application of low or no-cost efficiency strategies. By employing certain behavioral and operational adjustments as well as performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health, and safety can be improved; and annual energy, operation, and maintenance 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.

Close Doors and Windows

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

Practice Proper Use of Thermostat Schedules and Temperature Resets

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

Clean Evaporator/Condenser Coils on AC Systems

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

Clean and/or Replace HVAC Filters

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

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's potential for installing cost-effective PV solar array is questionable.

In order to be cost-effective, a solar PV array generally should have a minimum of 4,000 square feet of 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.

Based on the configuration of the site and its electric load, the economic potential for installing a solar PV system on this building is not ideal. Though the rooftop has no obstructions that might shade solar panels, it is not very large, nor is it ideally oriented for solar generation. Ideally a solar project should have a large flat rooftop or southward facing rooftop. The District Office is a small building with east-west sloping roof. Orientation of panels to the south might be possible, with the proper racking system, but that would increase the cost and the weight of the system.

The adjacent building (Frog Pond Elementary School), has a solar PV array installed on its rooftop and it has additional room for expansion. We suggest that it would likely be more economic for the School District to expand generating capacity at the adjacent building first, rather than consider installing a small array on the District Office Building.

If Little Egg Harbor School District is interested in expanding its current solar power generation, then it would likely be more cost effective to add PV panels to the rooftop of Frog Pond Elementary first. The roof of the District Office might be a feasible site, if it were part of a much large expansion of the elementary school system. Otherwise, it is probably too small to be economically feasible.

Potential	Low	
System Potential	11	kW DC STC
Electric Generation	13,105	kWh/yr
Displaced Cost	$2,660	/yr
Installed Cost	$28,600	

Solar projects should register their projects in the SREC Registration Program prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

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 and recovery of heat which is put to beneficial use. Common prime movers in CHP applications include reciprocating engines, microturbines, fuel cells, and (at large facilities) gas turbines. Electricity is typically interconnected to the sites local distribution system. Heat is recovered from the exhaust stream and the ancillary cooling system and interconnected to the existing hot water (or steam) distribution system.

CHP systems are typically used to produce a portion of the electricity needed by a facility, with the balance of electric needs satisfied by purchase from the grid. 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. The facility does not have sufficient thermal load to make CHP cost effective.

7 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and others, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's 1999 Electricity Restructuring Law which requires all customers of investor-owned electric and gas utilities to pay this charge on their monthly energy bills. As a contributor to the fund you were able to participate in the LGEA program and are also eligible to utilize the equipment incentive programs. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 19 for a list of the eligible programs identified for each recommended ECM.

Figure 19 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings
ECM 1	Install LED Fixtures	X		X	
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	X		X	
ECM 3	Retrofit Fixtures with LED Lamps	X		X	
ECM 4	Install Occupancy Sensor Lighting Controls	X		X	
ECM 5	Install High Efficiency Electric AC				

SmartStart is generally well suited for implementation of individual or small sets of measures, with the flexibility to install projects at your own pace using in-house staff or a preferred contractor. Direct Install caters to small to mid-size facilities to bundle measures and simplify participation, 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 and 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; applicants can use in-house staff or preferred contractor.

Generally, the incentive values provided throughout the report assume the SS program is utilized because it provides a consistent comparison of available incentives.

Brief descriptions of all relevant alternative financing and incentive programs are located in the sections below or www.njcleanenergy.com/ci.

7.1 SmartStart

Overview

The SmartStart program is comprised of new construction and retrofit components that offer incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives for various energy efficiency equipment based on national/market trends, new technologies or changes in efficiency baselines.

Prescriptive Equipment Incentives 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

All customer sizes and types may be served by this program. This program provides an effective mechanism for securing incentives for individual projects that may be completed at once or over several years.

Incentives

The prescriptive path provides fixed incentives for specific energy efficiency measures whereas the custom measure path provides incentives for unique or specialized technologies that are not addressed through prescriptive offerings.

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 the lesser of 50% of the total installed incremental project cost, or a buy down to a one-year payback. 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.

7.2 Direct Install

Overview

Direct Install is a turnkey program available to existing small to mid-sized facilities with a peak electric demand that did not exceed 200 kW in the preceding 12 months. You will work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and install those measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives and controls.

Incentives

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

How to Participate

To participate in the DI program you will need to contact the participating contractor assigned to the county where your facility is located; a complete list is provided on the Direct Install website identified below. The contractor will be paid the program incentive directly 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 mentioned above, and the remaining 30% of the cost is your responsibility to the contractor.

Since Direct Install offers a free assessment, LGEA applicants that do not meet the audit program eligibility requirements, but do meet the DI requirements, may be moved directly into this program.

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

7.3 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 into 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. Detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

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

8 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

8.1 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.

8.2 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 natural gas from a third party supplier.

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
Front Exterior	6	Incandescent: Recessed Cans w/ (1) 60W Incandescent Bulb	None	60	2,920	LED Retrofit	No	6	LED Screw-In Lamps: LED Spotlight Retrofit Kit - Recessed Can (9.5W)	None	10	2,920	0.24	1,035	0.0	$209.89	$418.56	$0.00	1.99
Front Exterior	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	46	2,920	None	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	46	2,920	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Parking Lot	23	Metal Halide: (1) 400W Lamp	None	458	2,920	LED Retrofit	No	23	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	None	135	2,920	5.91	25,380	0.0	$5,146.08	$12,837.91	$2,300.00	2.05
Central Corridor	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,600	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,120	0.17	390	0.0	$79.14	$832.50	$120.00	9.00
Sm. Conf. Area	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	700	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	490	0.07	68	0.0	$13.85	$233.00	$40.00	13.94
Office 1	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,400	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	980	0.18	361	0.0	$73.13	$401.40	$80.00	4.39
Office 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,400	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	980	0.18	361	0.0	$73.13	$401.40	$80.00	4.39
Office of Instructional Services	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,400	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	980	0.35	721	0.0	$146.26	$686.80	$140.00	3.74
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	200	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	200	0.09	26	0.0	$5.31	$190.27	$40.00	28.28
Technical Assistance Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,400	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	980	0.10	205	0.0	$41.55	$291.50	$50.00	5.81
Foyer	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	1,400	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	1,400	0.05	95	0.0	$19.26	$226.92	$0.00	11.78
Main Conference Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,000	Delamp & Add Reflectors	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	40	700	0.41	604	0.0	$122.41	$1,260.06	$95.00	9.52
Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,000	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	700	0.12	172	0.0	$34.82	$306.27	$60.00	7.07
Men's Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	500	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	350	0.12	86	0.0	$17.41	$460.27	$75.00	22.13
Men's Room Closet	1	Incandescent: Recessed Cans w/ (1) 60W Incandescent Bulb	Wall Switch	60	100	Relamp	No	1	LED Screw-In Lamps: (1) 9W LED Screw-In Bulb	Wall Switch	9	100	0.04	6	0.0	$1.21	$53.75	$10.00	36.16
Women's Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	500	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	350	0.12	86	0.0	$17.41	$460.27	$75.00	22.13
Superintendent's Office	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,400	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	980	0.58	1,202	0.0	$243.77	$1,067.33	$220.00	3.48
School Board Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,400	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	980	0.35	721	0.0	$146.26	$1,110.80	$190.00	6.30
Board Office 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,400	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	980	0.12	240	0.0	$48.75	$306.27	$60.00	5.05
BA Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,400	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	980	0.10	205	0.0	$41.55	$291.50	$50.00	5.81

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
Multiple	Offices	1	Split-System AC	2.00		Yes	1	Split-System AC	2.00		18.00		No	0.71	945	0.0	$191.62	$2,992.44	$184.00	14.66
Multiple	Offices	3	Split-System AC	2.00		Yes	3	Split-System AC	2.00		18.00		No	2.14	2,835	0.0	$574.86	$8,977.32	$552.00	14.66

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
Mech Rm	Whole Building	1	Furnace	110.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

DHW Inventory & Recommendations

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

Commercial Refrigerator/Freezer Inventory & Recommendations

	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
Main Conf. Room	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Main Conf. Rm.	1	TV	150.0	No
Main Conf. Rm.	1	Microwave	800.0	No
Copy Rm	1	Printer	494.0	No
Copy Rm	1	TV	150.0	No
Offices	8	Computer Work Stations	137.0	Yes
Offices	7	Printers	80.0	Yes
Offices	1	Fax Machine	350.0	No

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]

Joan C. Bard Administration Building

Primary Property Type: Office
Gross Floor Area (ft²): 4,000
Built: 1998

For Year Ending: December 31, 2015
Date Generated: January 09, 2017

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Joan C. Bard Administration Building 307 Frog Pond Road Little Egg Harbor, New Jersey 08087	Little Egg Harbor School District 305 Frog Pond Rd Little Egg Harbor, NJ 08087 (____)____-_____	Katrina Reigelman 305 Frog Pond Rd Little Egg Harbor, NJ 08087 609-296-1719 ext.1010 treigelman@lehsd.k12.nj.us

Property ID: 5720010

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
103.2 kBtu/ft²

Source EUI
238.7 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	163,600 (40%)
Electric - Grid (kBtu)	249,339 (60%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	64
National Median Source EUI (kBtu/ft²)	148.1
% Diff from National Median Source EUI	61%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	37

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)