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**Local Government Energy Program
DRAFT-Energy Audit Report**

For

***Lawrence Township
Municipal Building / EMS Garage
357 Main Street
Cedarville, NJ 08311***

Project Number: LGEA47



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INTRODUCTION

On January 19th, Steven Winter Associates, Inc. (SWA) and PMK performed an energy audit and assessment of the Lawrence Township Municipal Building / EMS Garage in Cedarville, NJ. Current conditions and energy-related information were collected in order to analyze and facilitate the implementation of energy conservation measures for the building.

The Lawrence Township Municipal and EMS Building is a total of 10,630 square feet. The original bi-level Municipal Hall and two-bay EMS garage were built in 1958. The lower level of the Municipal building contains; the court room, zoning offices, and storage space. The first or main level, houses the town clerk, committee offices, a conference room, restrooms, stock room, and record storage. In 1985, the Township built an addition extending the EMS garage space to include an additional two garage bays.

The Lawrence Township Municipal and EMS Building is occupied consistently by 3 to 10 employees for 39 hours a week.

Energy data and building information collected in the field were analyzed to determine the baseline energy performance of the building. Using spreadsheet-based calculation methods, SWA and PMK estimated the energy and cost savings associated with the installation of each of the recommended energy conservation measures. The findings for the building are summarized in this report.

The goal of this energy audit is to provide sufficient information to make decisions regarding the implementation of the most appropriate and most cost effective energy conservation measures for the building.

Launched in 2008, the LGEA Program provides subsidized energy audits for municipal and local government-owned facilities, including offices, courtrooms, town halls, police and fire stations, sanitation buildings, transportation structures, schools and community centers. The Program will subsidize 75% of the cost of the audit. If the net cost of the installed measures recommended by the audit, after applying eligible NJ SmartStart Buildings incentives, exceeds the remaining cost of the audit, then that additional 25% will also be paid by the program. The Board of Public Utilities (BPU's) Office of Clean Energy has assigned TRC Energy Services to administer the Program.

EXECUTIVE SUMMARY

This document contains the energy audit report for the Lawrence Township Municipal/EMS building at 697 Main Street, Cedarville, NJ 08311.

Based on the field visit performed by Steven Winter Associates (SWA) and PMK staff on January 19th, 2010 and the results of a comprehensive energy analysis, this report describes the site's current conditions and recommendations for improvements. Suggestions for measures related to energy conservation and improved comfort are provided in the scope of work. Energy and resource savings are estimated for each measure that results in a reduction of heating, cooling, and electric usage.

Current conditions

In the most recent full year of data collected, December, 2008 through November, 2009, the Municipal/EMS Building consumed a total of 60,523 kWh of electricity for a total cost of \$10,398. In the most recent full year of natural gas data collected, December, 2008 through November, 2009, 4,321.630 therms of gas were consumed for a total cost of \$6,160.33. With electricity and natural gas combined, the building consumed 898 MMBtus of energy at a total cost of \$17,453.

SWA/BSG-PMK has entered energy information about the Lawrence Township Municipal Building / EMS Garage in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The building performance rating was not able to be determined because the building use is classified as Other in the Portfolio Manager system.

The Site Energy Use Intensity is 84.0 kBtu/ft²yr compared to the national average of a similar building consuming 104.0 kBtu/ft²yr. Implementing the recommendations included in this report will reduce the building energy consumption by approximately 14.2 kBtu/ft²yr. There may be energy procurement opportunities for Lawrence Township to reduce annual utility costs, which are \$1,320/yr higher, when compared to the average estimated NJ commercial utility rates.

Based on the assessment of the Lawrence Township Municipal Building / EMS Garage, SWA/BSG-PMK has separated the recommendations into three categories (See Section 4 for more details). These are summarized as follows:

Category I Recommendations: Capital Improvements:

- The domestic water heater, installed in 2001, is nearing the end of its useful life and should be replaced with a high-efficiency, gas-fired replacement. Due to low savings from upgrading a gas water heater to another gas water heater, this could not be recommended as an ECM.
- Replace all aluminum framed single pane windows with vinyl framed double pane, thermally broken windows.

Category II: Operations & Maintenance:

- Fill and repair cracks in exterior brick and concrete masonry block.
- Recommend installing new step flashing properly to prevent future water damage.

- A photocell, located outside, is currently shaded, causing a single incandescent bulb to operate at all hours of the day. It is recommended that the obstruction be removed.
- An 8,000 BTU Friedrich window unit air-conditioner, installed in 1981, is well beyond its useful life and in poor condition. Units are available that have Energy Efficiency Ratios (EERs) up to 10.5, and can save \$50-100 per year in electric costs, depending on how frequently the unit is used.

Category III: Energy Conservation Measures:

At this time, SWA/BSG-PMK highly recommends a total of **2** Energy Conservation Measures (ECMs) for the Lawrence Township Municipal Building / EMS Garage that are summarized in the following table. The total investment cost for these ECMs, with incentives, is **\$12,105** (based on a projected eligibility for New Jersey's Office of Clean Energy current incentive and rebate programs). SWA/BSG-PMK estimates a first year savings of **\$2,267** with an aggregated simple payback of **5.3 years**. SWA/BSG-PMK estimates that implementing the highly recommended ECMs will reduce the carbon footprint of the facility by **22,903 lbs of CO₂**.

There are various incentives that the Lawrence Township Municipal Building / EMS Garage could apply for that could also help lower the cost of installing the ECMs. SWA/BSG-PMK recommends that Lawrence Township apply for the NJ SmartStart program through the New Jersey Office of Clean Energy. This incentive can help provide technical assistance for the building in the implementation phase of any energy conservation project.

The following table summarizes the proposed Energy Conservation Measures (ECM) and their economic relevance:

ROI: Return on Investment (%)

Assumptions:

Discount rate: 3.2% per DOE FEMP guidelines

Energy price escalation rate: 0% per DOE FEMP guidelines

Electricity rate \$0.17 \$/kWh

Gas rate \$1.02 \$/therm

Avg. Annual Demand: 0.003247

Area of Building (SF)

10,630

Table 1 - Highly Recommended 0-5 Year Payback ECMs																			
ECM #	ECM description	Source	Est. Installed Cost, \$	Est. Incentives, \$	Net Est. ECM Cost with Incentives, \$	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, \$	Total 1st Yr Savings, \$	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, \$	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, \$	CO ₂ Reduced, lbs/yr
1	High-Efficiency Modulating Furnaces	Contractor	\$30,000	\$24,000	\$6,000	0	0.00	1,331	12.53	\$0	\$1,358	18	\$18,367	4.42	1145%	64%	22%	\$12,679	15,578
TOTAL			\$30,000	\$24,000	\$6,000	0	0.00	1,331	12.53	\$0.00	\$1,358	-	\$18,367	4.42	-	-	-	\$12,679	15,578

Table 2 - Recommended 5-10 Year Payback ECMs																			
ECM #	ECM description	Source	Est. Installed Cost, \$	Est. Incentives, \$	Net Est. ECM Cost with Incentives, \$	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, \$	Total 1st Yr Savings, \$	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, \$	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, \$	CO2 Reduced, lbs/yr
2	Lighting Upgrades	Empirical Data	\$6,420	\$1,020	\$5,400	4,756	1.29	0	1.53	\$0	\$808	15	\$9,513	6.68	508%	34%	12%	\$4,252	6,515
	Occupancy Sensors		\$920	\$215	\$705	591	0.16	0	0.19	\$0	\$100	10	\$848	7.02	203%	20%	120%	\$6,528	809
TOTAL			\$7,340	\$1,235	\$6,105	5,346	1.45	0	1.72	\$0.00	\$909	-	\$10,361	6.72	-	-	-	\$10,779	7,325

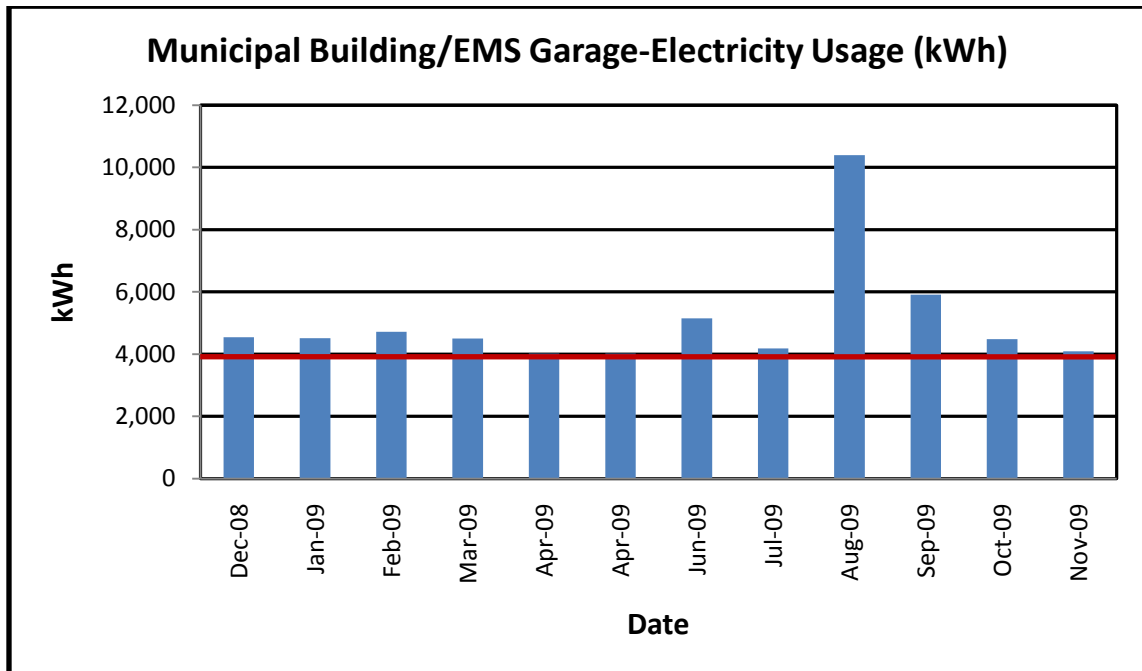
1. HISTORIC ENERGY CONSUMPTION

1.1. Energy Usage and Cost Analysis

SWA/BSG-PMK analyzed utility bills that were received from the utility companies supplying the Lawrence Township Municipal/EMS building with electric from December, 2008 through November, 2009, and natural gas from December, 2008 through November, 2009.

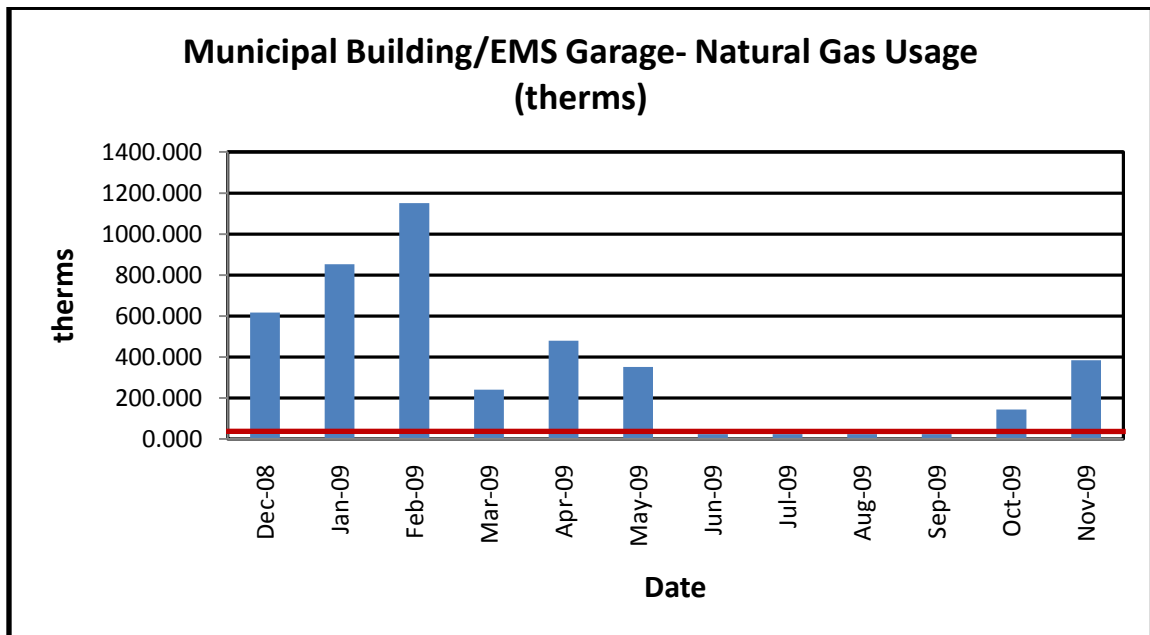
Electricity – The Lawrence Township Municipal Building / EMS Garage is currently served by one electric meter. The facility currently receives electricity from Atlantic City Electric at **an average rate of \$0.172/kWh** based on 12 months of utility bills from December, 2008 through November, 2009. The facility consumed **approximately 60,523 kWh or \$10,398 worth of electricity** in the previous year with an average monthly demand of 16.4 kW.

The following charts show electricity usage for the Lawrence Township Municipal Building / EMS Garage based on utility bills for the billing analysis period. The red line indicates the estimated baseload in kWh.



Natural Gas – The Lawrence Township Municipal Building / EMS Garage is currently served by one meter for natural gas. The facility currently receives natural gas from South Jersey Gas at **an average aggregated rate of \$1.43/therm** based on 12 months of utility bills for December, 2008 to November, 2009. The facility consumed **approximately 4,321.630 therms or \$6,160 worth of natural gas** in the previous year.

The following charts show the natural gas usage for the Lawrence Township Municipal Building / EMS Garage based on utility bills for the analysis period of December 2008 through November 2009:



The natural gas usage mimics seasonal needs for heating the buildings showing that natural gas is primarily used for heating. The red line indicates the baseload level for the heating, domestic hot water, and cooking needs. The natural gas usage above the red line shows the amount of natural gas used for heating.

1.2. Utility Rate

The Lawrence Township Municipal Building/EMS Garage currently receives electricity from Atlantic City Electric at a general service market rate for electricity use (kWh) with (kW) demand charge. The facility currently pays an average rate of approximately \$0.17/kWh based on the most recent 12 months of utility bills.

The Lawrence Township Municipal Building/EMS Garage currently receives natural gas supply from South Jersey Gas at a general service market rate for natural gas in (therms). There is one gas meter that provides natural gas service to the facility. The average aggregated rate (supply and transport) for the meter is approximately \$1.02/therm based on 12 months of utility bills for December, 2008 to November, 2009.

1.3. Energy Benchmarking

SWA/BSG-PMK has entered energy information about The Municipal Building/EMS Garage in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The username is *lawrencetownship* and the password is *lawrence*. The building performance rating was not able to be determined because the building use is classified as Other in the Portfolio Manager system.

The Site Energy Use Intensity is 84.0 kBtu/sq.ft./yr compared to the national average of buildings classified as "other" consuming 104.0 kBtu/sq.ft./yr. Implementing this report's recommended Energy Conservation Measures (ECMs) will reduce use by approximately 14.2 kBtu/sq.ft./yr.

SWA/BSG-PMK has created the Portfolio Manager site information for Municipal Building/EMS Garage. This information can be accessed at: <https://www.energystar.gov/istar/pmpam/>, with the following:

Username: *lawrencetownship*

Password: *lawrence*



STATEMENT OF ENERGY PERFORMANCE Municipal Building/EMS

Building ID: 2245767
For 12-month Period Ending: November 30, 2009¹
Date SEP becomes ineligible: N/A

Date SEP Generated: March 18, 2010

Facility
Municipal Building/EMS
697 Main St
Cedarville, NJ 08311

Facility Owner
Lawrence Township of Cumberland
County
357 Main St
Cedarville, NJ 08311

Primary Contact for this Facility
Ruth Dawson
357 Main St
Cedarville, NJ 08311

Year Built: 1958
Gross Floor Area (ft²): 10,630

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	206,605
Natural Gas (kBtu) ⁴	686,785
Total Energy (kBtu)	893,390

Energy Intensity⁵

Site (kBtu/ft ² /yr)	84
Source (kBtu/ft ² /yr)	133

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	68
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Electric Distribution Utility

Pepco - Atlantic City Electric Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	-38%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional
N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

The government estimates the average time needed to fill out this form is 6 hours (includes the time for entering energy data, PE facility inspection, and notarizing the SEP) and welcomes suggestions for reducing this level of effort. Send comments (referencing OMB control number) to the Director, Collection Strategies Division, U.S., EPA (2622T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460.

EPA Form 5900-16

2. FACILITY AND SYSTEMS DESCRIPTION

2.1. Building Characteristics

The Lawrence Township Municipal/EMS building is a total of 10,630 square feet. The original bi-level Municipal Hall and two bay EMS garage was built in 1958. The lower level of the Municipal building contains; the court room, zoning offices, and storage space. The first or main level, houses the town clerk, committee offices, a conference room, restrooms, stock room, and record storage. In 1985, the Township built an addition extending the EMS garage space to include an additional two garage bays.

2.2. Building occupancy profiles

The Lawrence Township Municipal and EMS Building is occupied consistently by 3 to 10 employees for 39 hours a week.

2.3. Building envelope

2.3.1. Exterior walls

The base of the new addition walls are insulated concrete masonry units. The upper portion is framed with heavy duty metal studs clad with standing seam metal. The exterior walls of the Municipal/EMS Building are wood stud construction with batt insulation. The exterior is finished with brick veneer. The interior of the walls are finished with drywall and paint. Exterior and interior finishes of the envelope were found to be in fair condition. There were developing cracks that need to be readdressed. The below images show the large seams and cracks around the EMS overhead door frames and two large cracks developing in the rear of the building that need to be addressed.



Front



Rear

Category II Operation and Maintenance Recommendation: Fill and repair cracks in exterior brick and concrete masonry block.

2.3.2. Roof

The main roof is a wood truss system with ½” exterior grade plywood sheathing, 15# felt, and asphalt shingles. The roof over the 1985 addition is constructed of corrugated steel on top of steel beams with interior insulation. The attic floor is insulated with batt insulation. The roof, gutters and fascia boards are in good condition. The flashing on the chimney is not installed correctly and will lead to water leakage.



Category II Operations and Maintenance Recommendation: Recommend installing new step flashing properly to prevent future water damage.

2.3.3. Base

The Municipal Building portion of the facility has a finished basement with batt insulation on the walls and a 6” concrete slab beneath the tiled floor. The EMS portion of this facility is on a 6” concrete slab. There are no signs of water damage, improper drainage, or compromised structure.

2.3.4. Windows

There are seven single pane aluminum framed windows and two double pane vinyl framed windows throughout the building. The newer vinyl windows and screens are in good condition.



Category I Capital Improvement Recommendations: Replace all aluminum framed single pane windows with vinyl frame double pane, thermally broken windows.

2.3.5. Exterior doors

The Municipal Building has a set of double exterior aluminum medium style store front doors. The main entry has glass and a black finished aluminum. The three exterior doors on the EMS portion are a hollow metal insulated door. There are four overhead garage bay doors with insulation and intact weather stripping. All doors and hardware were found to be in good working order with functioning latches and good weather stripping.

2.3.6. Building air tightness

The building’s air tightness is in fair condition. The exterior cracks need to be addressed before they cause infiltration problem for the interior of the building. During the site visit no signs of infiltration or temperature imbalance were discovered.

2.4. HVAC systems

2.4.1. Heating

Heat for the Municipal portion of the building is provided by three original 1958 Lennox gas fired furnaces. Unit F-1 and F-2 feed the lower and first floor of the Municipal building and F-3 feeds the original two bay garage. There are a total of three Reznor ceiling mounted heaters that were installed in the new EMS garage area during the 1985 renovation. A fourth heating unit, an International Comfort Products 100MBH unit, provides cooling and supplemental heat for the first floor of the municipal building. All systems were observed and functioning properly however the original 1958 Lennox units are past there useful and efficient lives.



Category III Recommendation – ECM # 1 Replace the current 1958 Lennox furnaces with high-efficiency, modulating furnaces. These units are available with efficiencies up to 95%.

2.4.2. Cooling

The lower level of the Municipal/EMS building is cooled by window / through the wall air conditioning units. The first floor is cooled by a new Heil split system that was installed in 2008. The original garage bays and the new additional EMS bays are both cooled by two 3 ton split systems. The units are set up to operate via individual wall mounted programmable thermostats. The air handlers and condenser units were found to be in good operating condition.

2.4.3. Ventilation

There are three exhaust fans that provide ventilation for the restrooms and kitchen area. Each is controlled by a wall switch at the point of use.

2.4.4. Domestic Hot Water

The building's domestic hot water is supplied by a gas-fired 40 gallon Bradford White water heater.

2.5. Electrical systems

2.5.1. Lighting

A complete inventory of all interior, exterior, and exit sign light fixtures were examined and documented in Appendix A of this report including an estimated total lighting power consumption. Our initial findings indicate that performing a detailed lighting upgrade per the recommendations in Appendix A.

Category III Recommendation - ECM #2: Recommend upgrading all T-12 lighting fixtures with magnetic ballasts to T-8 fixtures with electronic ballasts, as well as installing lighting

sensors to certain areas where lights typically remain lit when unoccupied for long periods of time. These and various other lighting upgrades are outlined in Appendix A. .

Category II Recommendation – Operations & Maintenance: A photocell, located outside, is currently shaded, causing a single incandescent bulb to operate at all hours of the day. It is recommended that the obstruction be removed.

2.5.2.Appliances and Process

Appliances, such as refrigerators, that are over 10 years of age should be replaced with newer efficient models with the Energy Star label. For example, Energy Star refrigerators use as little as 315 kWh / yr. When compared to the average electrical consumption of older equipment, Energy Star equipment results in a large savings. Building management should select Energy Star label appliances and equipment when replacing: refrigerators, printers, computers, copy machines, etc. More information can be found in the “Products” section of the Energy Star website at: <http://www.energystar.gov>.

The building has a full kitchen including; (1) Frigidaire stove, (1) GE slow cooker, and (1) Whirlpool Freezer. All equipment was found to be in good condition. However, it is recommended that as this equipment fails it be replaced with Energy Star labeled appliances.

The building has total of (7) computers, (1) copy machine / printer.

2.5.3.Elevators

This building does have a hydraulic elevator.

3. Building Systems Equipment List

Building System	Description	Locations	Model #	Fuel	Space Served	Year Installed	Estimated Remaining Useful Life %
Heating	(3) Gas-fired unit heaters, 75,000/62,250 BTUH input/output	New EMS garage	Reznor, M# UDAP75, S# BIJ79Y2N18587X	Natural Gas	New EMS garage	2009	92%
Cooling	Wall air-conditioner	Office	LG	Electricity	Office		20%
Cooling	Wall air-conditioner, 8,000 BTU	Offices	Friedrich, M# SS08F10, S# DM3994	Electricity	Offices	1981	0%
Cooling	(2) wall air-conditioners, 18,500 BTU, 10 EER	Court room	Friedrich, M# SM18J30A, S# JFBS01012	Electricity	Court room		60%
DHW	40 gallon, 40 MBH water heater	Mechanical room	Bradford White, M# MI403S6EN12, S# XE0356EN12	Natural Gas	Entire building	2001	31%
Heating	F-1: Forced-air furnace, 135/108 MBH input/output	Basement of EMS garage	Lennox, M# GH54-135S	Natural Gas	Court room, construction office	1958	0%
Heating	F-2: Forced-air furnace w/ cooling coil, 135/108 MBH input/output	Basement of EMS garage	Lennox, M# GH54-135S	Natural Gas	Court room	1958	0%
Heating	F-3: Forced-air furnace w/ cooling coil, 135/108 MBH input/output	Basement of EMS garage	Lennox, M# GH54-135S	Natural Gas	Old EMS garage	1958	0%
Cooling	3-ton condensing unit	Roof	Arcoaire, M# H2A360GKA100	Electricity	Old bay	2007	80%
	Fan coil, 2000 CFM	Garage area	International Comfort Products, M# FSM2X6000A, S# A080685274			2008	
Cooling	3-ton condensing unit	Roof	Arcoaire, M# H2A360GKA100	Electricity	New bay	2007	80%
	Fan coil, 2000 CFM	Garage area	Arcoaire, M# H2A360GKA101, S# A080783674			2008	
Heating/ Cooling	Forced-air furnace w/ cooling coil, 100 MBH	2nd floor	International Comfort Products, M# GNM100N16A3, S# L010387221	Natural Gas	1st floor	2008	89%
	3-ton condensing unit, 13 SEER	Outside	Hiel, M# NAC036AKA1, S# LO13103648	Electricity			40%

Appliances	Stove	Kitchen	Frigidaire	Natural Gas	Kitchen		50%
Appliances	Slow-cooker	Kitchen	GE	Electricity	Kitchen		50%
Appliances	Electric can opener	Kitchen	Black & Decker	Electricity	Kitchen		50%
Appliances	Freezer	Kitchen	Whirlpool, M# EV130C	Electricity	Kitchen		50%
Ventilation	(3) exhaust fans	Roof	No nameplate	Electricity	General exhaust		50%
Ventilation	Fan	Garage bay	Patton, M# 1010MP	Electricity	Garage bay		20%
Appliances	Coffee maker	Kitchen	Mr. Coffee	Electricity	Kitchen		50%
Appliances	Harford walk-in box	Kitchen	Bohn, M# AD0700F, S# DSF00262	Electricity	Kitchen		50%

Note: *The remaining useful life of a system (in %) is the relationship between the system manufactured and / or installed date and the standard life expectancy of similar equipment based on ASHRAE (2003), ASHRAE Handbook: HVAC Applications, Chapter 36.

4. ENERGY CONSERVATION MEASURES

Based on the assessment of this building, SWA and BSG-PMK have separated the investment opportunities into three categories of recommendations:

1. Capital Improvements – Upgrades not directly associated with energy savings
2. Operations and Maintenance – Low Cost/No Cost Measures
3. Energy Conservation Measures – Higher cost upgrades with associated energy savings

Category I Recommendations: Capital Improvements:

- The domestic water heater, installed in 2001, is nearing the end of its useful life and should be replaced with a high-efficiency, gas-fired replacement. Due to low savings from upgrading a gas water heater to another gas water heater, this could not be recommended as an ECM.
- Replace all aluminum framed single pane windows with vinyl framed double pane, thermally broken windows.

Category II: Operations & Maintenance:

- Fill and repair cracks in exterior brick and concrete masonry block.
- Recommend installing new step flashing properly to prevent future water damage.
- A photocell, located outside, is currently shaded, causing a single incandescent bulb to operate at all hours of the day. It is recommended that the obstruction be removed.
- An 8,000 BTU Friedrich window unit air-conditioner, installed in 1981, is well beyond its useful life and in poor condition. Units are available that have Energy Efficiency Ratios (EERs) up to 10.5, and can save \$50-100 per year in electric costs, depending on how frequently the unit is used.

Category III Recommendations: Energy Conservation Measures:

Summary table

ECM #	Description
1	High-Efficiency Modulating Furnaces
2	Lighting Upgrades & Occupancy Sensors

ECM#1: High-Efficiency Modulating Furnaces

Description:

The Municipal building is heated by three Lennox 135-MBH gas-fired furnaces, located in the basement, as well as an International Comfort Products 100-MBH gas-fired furnace. The three Lennox units are at the end of their 18-year useful life, and should be replaced. Higher-efficiency modulating furnaces are now available, which are up to 95% efficient. The current units were 80% efficient at the time of their purchase, but due to their age and condition, were estimated to decrease by 10%, to 70%.

Installation cost:

Estimated installed cost: \$10,000 for each furnace, \$30,000 total

Source of cost estimate: Similar Projects

Economics:

ECM #	ECM description	Source	Est. Installed Cost, \$	Est. Incentives, \$	Net Est. ECM Cost with Incentives, \$	kWh, 1st Yr Savings	kW Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, \$	Total 1st Yr Savings, \$	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, \$	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, \$	CO2 Reduced, lbs/yr
1	High-Efficiency Modulating Furnaces	Contractor	\$30,000	\$24,000	\$6,000	0	0.00	942	8.87	\$0	\$961	18	\$13,001	6.24	643%	36%	15%	\$7,222	11,027

Assumptions:

The cost per therm of natural gas that was used, taken from twelve months of the Municipal building's energy bills, was \$1.02. Also taken from the energy bills was the number of heating degree-days for one year, 5,168. Due to the fact that the Municipal building only operates 39 out of a possible 168 hours every week, only $\frac{39}{168}$ of the heating degree days were used for these calculations. The 99.6% heating dry bulb temperature is 10°F, which was provided by ASHRAE, and the desired indoor temperature was estimated to be 68°F. The savings were calculated using the following equations:

$$\frac{\text{Capacity} \times \text{Degree-Days} \times 24}{\text{Efficiency}_{\text{current}} \times (\text{Temp}_{\text{indoor}} - \text{Temp}_{99.6\%})} \times \frac{1 \text{ therm}}{100,000.4 \text{ BTU}} \times \frac{(\text{Weekly Operating Hours})}{24 \times 7} = \text{Current Gas Input (therms)}$$

$$\text{Gas Output (therms)} = \text{Current Gas Input} \times \text{Efficiency}_{\text{current}}$$

$$\text{Proposed Gas Input (therms)} = \frac{\text{Gas Output}}{\text{Efficiency}_{\text{proposed}}}$$

$$\text{Savings (therms)} = \text{Current Gas Input} - \text{Proposed Gas Input}$$

Rebates/financial incentives:

This ECM is calculated based on a projected eligibility for New Jersey's Direct Install Rebate, which pays up to 80% of the total installation cost for the furnaces, or \$24,000 for this measure.

ECM #2: Lighting Upgrade & Occupancy Sensors

Description:

Lighting at the Municipal Building primarily consists of standard-efficiency fixtures with T12 lamps and magnetic ballasts, and T8 lamps with electronic ballasts. SWA/BSG-PMK recommends retrofitting the T12 fluorescent lamps and magnetic ballasts with T8's and electronic ballasts. The existing T8's do not need to be upgraded. Also in the building are incandescent lamps, which should be replaced with longer lasting, more efficient compact fluorescent lamps. In addition, occupancy sensors should be installed to control the lighting in the private offices, the stock room, and the EMS restroom. Lighting replacements have short paybacks because of the low cost of the project combined with the high daily use of the lights.

Recommended lighting upgrades are detailed in Appendix A.

Installation cost:

Summary	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
Cost	\$6,420.00	\$920.00	\$7,340.00
Rebate	\$1,020.00	\$215.00	\$1,235.00
Net Cost	\$5,400.00	\$705.00	\$6,105.00
Savings (kWh)	4,756	591	5,260
Savings (\$)	\$808.47	\$100.41	\$894.17
Payback	6.7	7.0	6.8

Source of cost estimate: Empirical Data

Economics (without incentives):

ECM #	ECM description	Source	Est. Installed Cost, \$	Est. Incentives, \$	Net Est. ECM Cost with Incentives, \$	kWh, 1st Yr Savings	kW Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, \$	Total 1st Yr Savings, \$	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, \$	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, \$	CO2 Reduced, lbs/yr
2	Lighting Upgrades	Empirical Data	\$6,420	\$1,020	\$5,400	4,756	1.29	0	1.53	\$0	\$808	15	\$9,513	6.68	508%	34%	12%	\$4,252	6,515
	Occupancy Sensors		\$920	\$215	\$705	591	0.16	0	0.19	\$0	\$100	10	\$848	7.02	203%	20%	120%	\$6,528	809

Assumptions:

The electric cost used in this ECM was \$0.172/kWh, which was the facilities' average rate for the 12-month period from December, 2008 through November, 2009. The replacements for each lighting fixture, the costs to replace or retrofit each one, and the rebates and wattages for each fixture are located in Appendix A.

Rebates/financial incentives:

The New Jersey SmartStart offers rebates for upgrading lighting fixtures and installing lighting controls. The total rebate this ECM qualifies for is \$1,235.

5. RENEWABLE AND DISTRIBUTED ENERGY MEASURES

5.1. Existing systems

There are currently no existing renewable energy systems.

5.2. Solar Photovoltaic

Photovoltaic (PV) technology was considered for installation on the roofs of the Municipal Building. Based on the shading and the amount of roof area available it was determined that PV installations are not cost effective for this project.

5.3. Solar Thermal Collectors

Solar thermal collectors are not recommended due to the low amount of domestic hot water use throughout the building.

5.4. Combined Heat and Power

Combined Heat Power is not applicable to this project because of the HVAC system type and limited domestic hot water usage.

5.5. Geothermal

Geothermal is not applicable to this project because it would require modifications to the existing heat distribution system, which would not be cost effective.

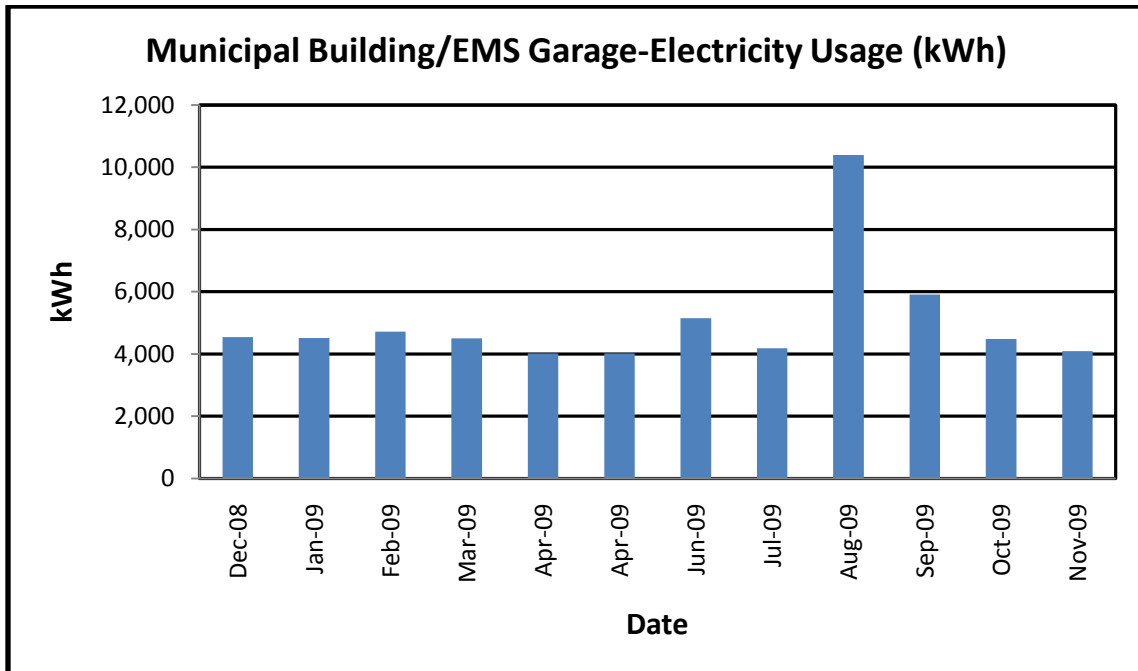
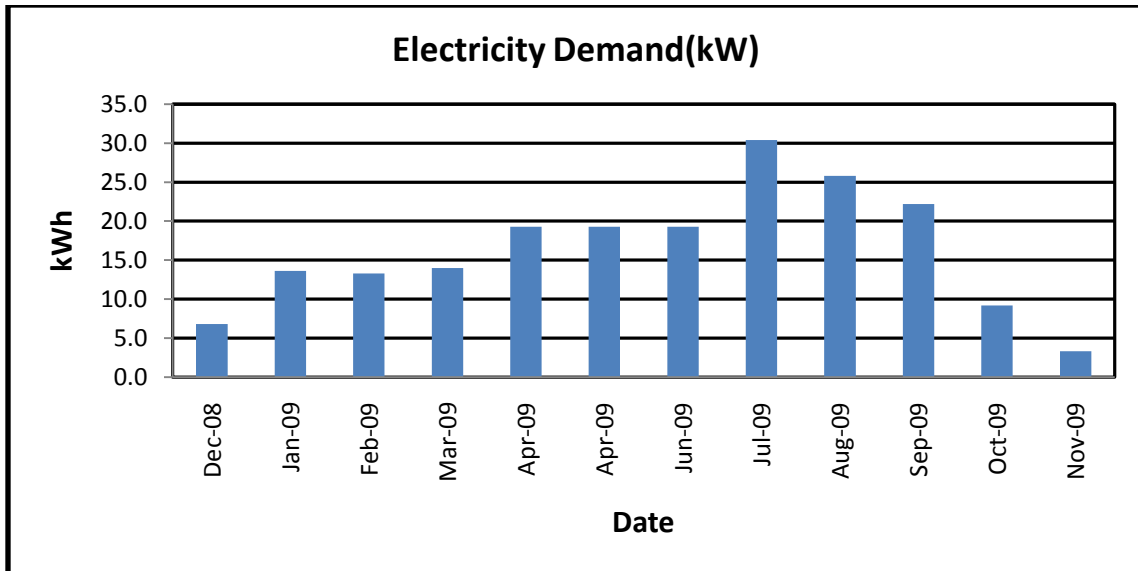
5.6. Wind

Wind power production is not appropriate for this location because required land is not available for the wind turbine. Also, the available wind energy resource is very low.

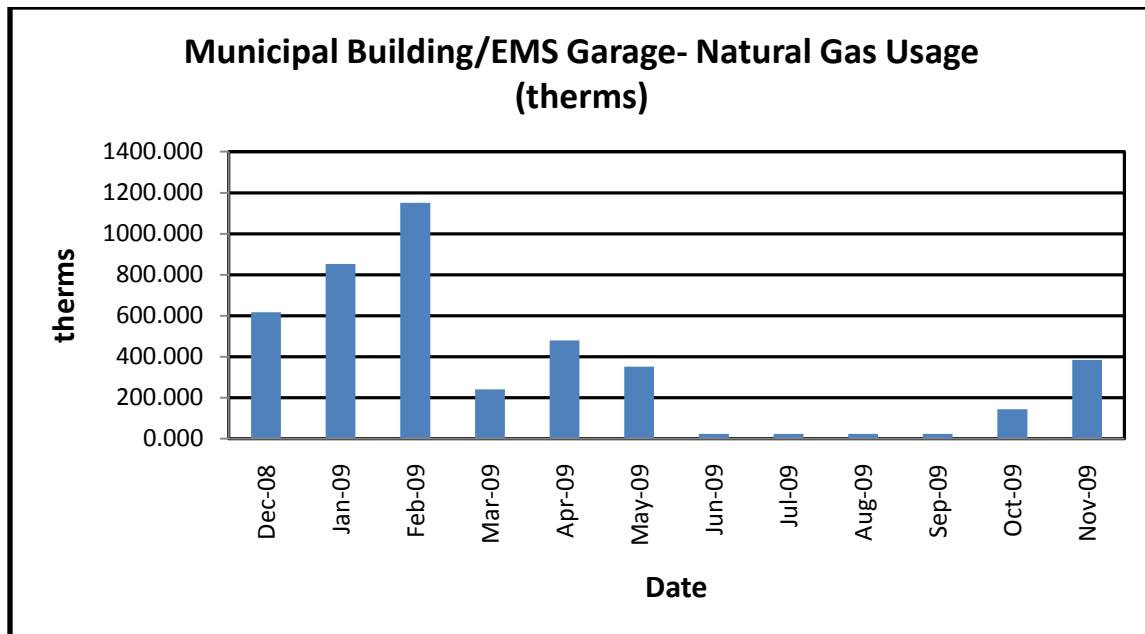
6. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

6.1. Energy Purchasing

The average electrical peak demand for the previous year was 16.4 kW and the maximum peak demand was 30.4 kW. The electric and gas load profiles for this project are presented in the following charts. The first chart shows electric demand (in kW) for the previous 12 months and the other two charts show electric and gas usage (in kWh), respectively.



The electrical demand peaks (except for a few fluctuations) follow the electrical consumption peaks.



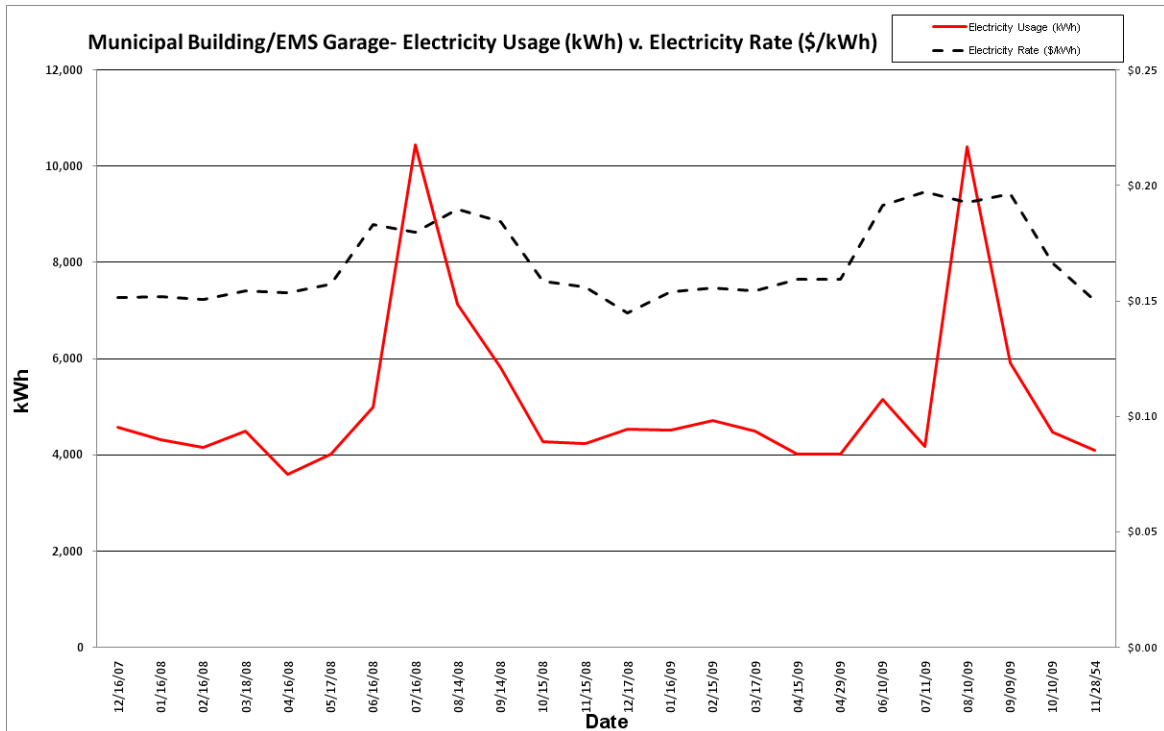
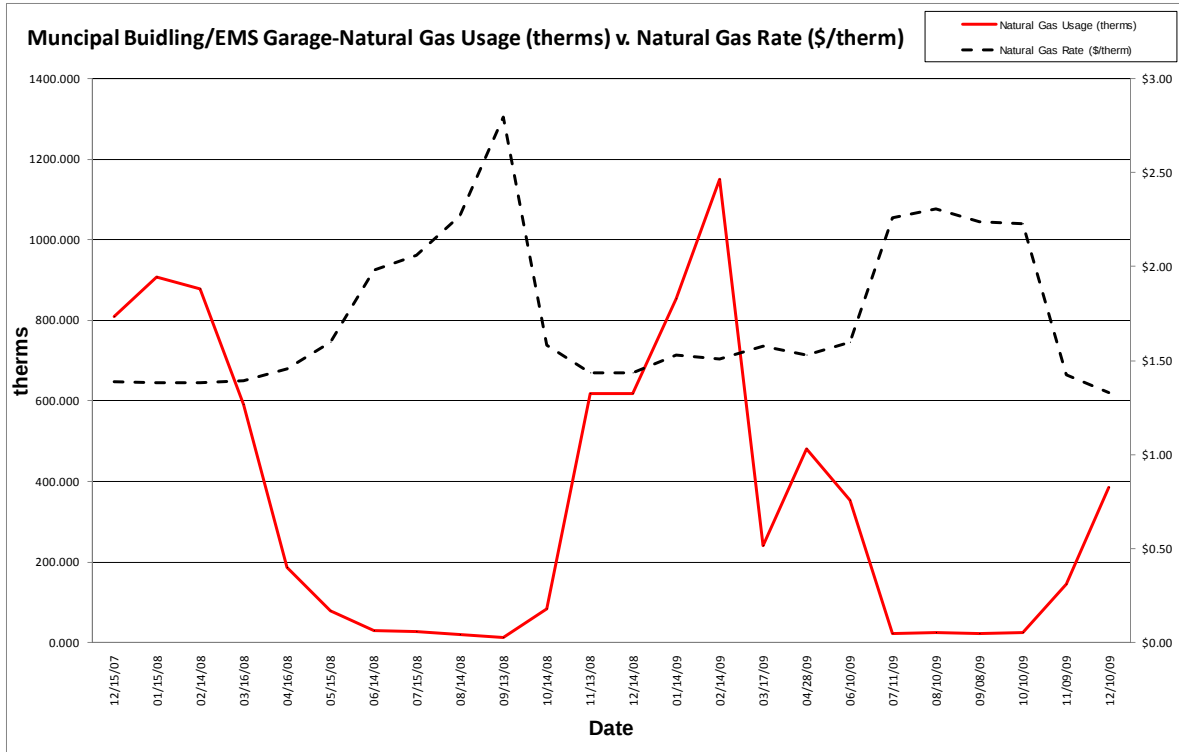
The natural gas usage shows that the most natural gas is consumed in the winter months, meaning the primary use of natural gas in this building is for heating.

6.2. Tariff analysis

Currently, natural gas is provided via one gas meter with South Jersey Gas serving as transmission and supply provider. The general service rate for natural gas charges a market-rate price based on use and the Municipal Building/EMS Garage billing data does not breakdown demand costs for all periods. Typically, the natural gas prices increase during the heating months when natural gas is used by the furnace and unit heaters.

The Municipal Building/EMS Garage is direct-metered (via one meter) and currently purchases electricity from Atlantic City Electric at a general service rate. The general service rate for electric charges are market-rate based on use and the Municipal Building/EMS Garage billing does show a breakdown of demand costs. Demand prices are reflected in the utility bills and can be verified by observing the price fluctuations throughout the year. Typically, the electricity prices increase during the cooling months when electricity is used by the HVAC condensing units and air handlers.

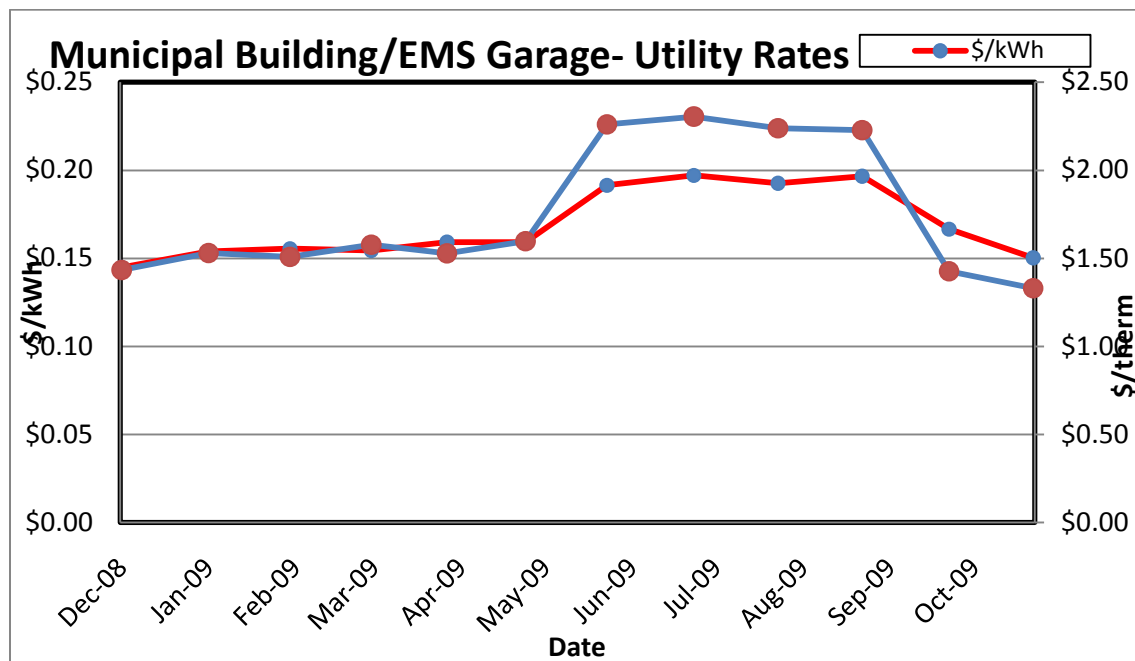
The following charts compare the utility consumption and utility rates for the natural gas and electricity over the previous two year period.



6.3. Energy Procurement strategies

Billing analysis shows large price fluctuations of over the course of the year for the Lawrence Township Municipal Building / EMS Garage natural gas account. Changing third party suppliers could reduce the cost associated with energy procurement. Customers that have a large variation in monthly billing rates can often reduce the costs associated with energy procurement by selecting a third party energy supplier. Contact the NJ Energy Choice Program for further information on Energy Services Companies (ESCOs) that can act as third party energy suppliers. Appendix B contains a complete list of third party energy suppliers.

SWA/BSG-PMK also recommends that Lawrence Township contact third party energy suppliers in order to negotiate a lower electricity rate. Comparing the current electric rate to average utility rates of similar type buildings in New Jersey, which are approximately \$0.15/kWh, it may be possible to save up to \$ 0.02/kWh, which would have equated to \$1,320 for the past 12 months. Lawrence Township already purchases natural gas for lower rate than the average rate of \$1.55/therm.



7. METHOD OF ANALYSIS

7.1. Assumptions and methods

Energy modeling method: Spreadsheet-based calculation methods

Cost estimates: RS Means 2009 (Facilities Maintenance & Repair Cost Data)

RS Means 2009 (Building Construction Cost Data)

RS Means 2009 (Mechanical Cost Data)

Note: Cost estimates also based on utility bill analysis and prior experience with similar projects.

7.2. Disclaimer

This engineering audit was prepared using the most current and accurate fuel consumption data available for the site. The estimates that it projects are intended to help guide the owner toward best energy choices. The costs and savings are subject to fluctuations in weather, variations in quality of maintenance, changes in prices of fuel, materials, and labor, and other factors. Although we cannot guarantee savings or costs, we suggest that you use this report for economic analysis of the building and as a means to estimate future cash flow.

THE RECOMMENDATIONS PRESENTED IN THIS REPORT ARE BASED ON THE RESULTS OF ANALYSIS, INSPECTION, AND PERFORMANCE TESTING OF A SAMPLE OF COMPONENTS OF THE BUILDING SITE. ALTHOUGH CODE-RELATED ISSUES MAY BE NOTED, SWA STAFF HAVE NOT COMPLETED A COMPREHENSIVE EVALUATION FOR CODE-COMPLIANCE OR HEALTH AND SAFETY ISSUES. THE OWNER(S) AND MANAGER(S) OF THE BUILDING(S) CONTAINED IN THIS REPORT ARE REMINDED THAT ANY IMPROVEMENTS SUGGESTED IN THIS SCOPE OF WORK MUST BE PERFORMED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS THAT APPLY TO SAID WORK. PARTICULAR ATTENTION MUST BE PAID TO ANY WORK WHICH INVOLVES HEATING AND AIR MOVEMENT SYSTEMS, AND ANY WORK WHICH WILL INVOLVE THE DISTURBANCE OF PRODUCTS CONTAINING MOLD, ASBESTOS, OR LEAD.

LIGHTING ANALYSIS

Lawrence Township
Municipal/EMS Building
ADDRESS



Upgrade Code	Upgrade Description	Existing		Proposed		Lighting		
		Fixture	Watts	Fixture	Watts	Total # of Upgrades	Cost per Upgrade (\$)	SmartStart Rebate per Upgrade
1	LED Exit Sign / No Upgrade	LED	2	No Upgrade	2	8	\$0.00	\$0.00
2	(3) 32W T8 Lamps, Electronic Ballast / No Upgrade	3L4' T8/ELEC	89	No Upgrade	89	29	\$0.00	\$0.00
3	(4) 32W T8 Lamps, Electronic Ballast / No Upgrade	4L4' T8/ELEC	110	No Upgrade	110	8	\$0.00	\$0.00
4	(3) 34W T12 Lamps, Magnetic Ballast / Retrofit with (3) 28W T8 Lamps, Electronic Ballast	3H' EE/STD	130	3L4' T8/ELEC	89	2	\$80.00	\$15.00
5	(4) 34W T12 Lamps, Magnetic Ballast / Retrofit with (4) 28W T8 Lamps, Electronic Ballast	4H' EE/STD	160	4L4' T8/ELEC	110	16	\$90.00	\$15.00
6	60 W Incandescent / Replace with 13W Compact Fluorescent	60W INCANDESCENT	60	13W CF/SI	15	5	\$6.00	\$0.00
7	(2) 8' T12 Lamps, Magnetic Ballast / Retrofit with (2) 8' T8 Lamps, Electronic Ballast	2L8' EE/STD	138	2L8' T8/ELEC	118	39	\$80.00	\$15.00
8	13W Compact Fluorescent / No Upgrade	13W CF/SI	15	No Upgrade	15	1	\$0.00	\$0.00
9	(2) 34W T12 Lamps, Magnetic Ballast / Retrofit with (2) 28W T8 Lamps, Electronic Ballast	2H' EE/STD	80	2L4' T8/ELEC	61	8	\$60.00	\$15.00
10	Incandescent Exit Sign / Retrofit with LED	15W Exit	15	LED	2	3	\$40.00	\$10.00
11	(2) 32W T8 Lamps, Electronic Ballast / No Upgrade	2L4' T8/ELEC	61	No Upgrade	61	10	\$0.00	\$0.00
12	(1) 34W T12 Lamps, Magnetic Ballast / Retrofit with (1) 28W T8 Lamps, Electronic Ballast	1H' EE/STD	50	1L4' T8/ELEC	31	1	\$50.00	\$15.00
13	150W High Pressure Sodium Wall Pack / No Upgrade	150W HPS/BALLAST	190	No Upgrade		4	\$250.00	\$0.00
14	70W High Pressure Sodium Mini Wall pack	70W HPS/BALLAST	92	No Upgrade	92	2	\$0.00	\$0.00
15	Decorative Wall Mounted Lightning	100W INCANDESCENT	100	26W CF/HW	28	2	\$10.00	\$0.00

Summary	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
Cost	\$6,420.00	\$920.00	\$7,340.00
Rebate	\$1,020.00	\$215.00	\$1,235.00
Net Cost	\$5,400.00	\$705.00	\$6,105.00
Savings (kWh)	4,756	591	5,260
Savings (\$)	\$808.47	\$100.41	\$894.17
Payback	6.7	7.0	6.8

Variables:		Assumptions:	
\$0.17	Avg. Electric Rate (\$/kWh)	25%	Occupancy Sensor Savings (Avg)
	Avg. Demand Rate (\$/kW)	40%	Occupancy Sensor Savings(> Avg)
1924	Operating Hours/Year		
8	Operating Hours/Work Day		

Notes:

Seq. #	Upgrade Code	Room/Area	Hrs/ Work Day	Hrs/ Year	Existing			Proposed			kW Reduction	Lighting				Controls		Occupancy Sensors (ONLY)				SmartStart Rebate		Lighting & Occupancy Sensors								
					Fixture	Qty.	Watts	Foot Candles	Fixture	Qty.		Watts	Energy Savings, kWh	Cost (\$)	Savings (\$)	Payback (yrs)	Type	Qty.	Energy Savings, kWh	Cost (\$)	Savings (\$)	Payback (yrs)	Lighting	Sensors	Energy Savings, kWh	Post-Rebate Cost (\$)	Savings (\$)	Payback (yrs)				
Totals:					14483							11482	2 241	4756	\$6,420.00	\$808.47	7.9					591	\$920.00	\$100.41	9.2	\$1,020.00	\$215.00	5260	\$6,105.00	\$894.17	6.8	
1	1	Exit	24	8760	LED	8	16		No Upgrade	8	16	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
2	2	Lobby & Hallway	12	2886	3L4' T8/ELEC	6	534		No Upgrade	6	534	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
3	3	Lobby & Hallway	12	2886	4L4' T8/ELEC	1	110		No Upgrade	1	110	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
4	2	Elevator Machine Room	0.5	120.25	3L4' T8/ELEC	1	89		No Upgrade	1	89	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
5	11	Hallway	12	2886	2L4' T8/ELEC	10	610		No Upgrade	10	610	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
6	2	Mens Room	8	1924	3L4' T8/ELEC	1	89		No Upgrade	1	89	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
7	4	Storage Room	8	1924	3H' EE/STD	2	260		3L4' T8/ELEC	2	178	0.082	158	\$160.00	\$26.82	6.0		0	\$0.00	\$0.00		\$30.00	\$0.00	158	\$130.00	\$26.82	4.8					
8	2	Womens Room	8	1924	3L4' T8/ELEC	1	89		No Upgrade	1	89	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
9	2	Office	8	1924	3L4' T8/ELEC	4	356		No Upgrade	4	356	0	0	\$0.00	\$0.00		OSR	1	171	\$260.00	\$29.11	8.9	\$0.00	\$140.00	171	\$120.00	\$29.11	4.1				
10	2	Office Area	8	1924	3L4' T8/ELEC	15	1335		No Upgrade	15	1335	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
11	2	Closet	1	240.5	3L4' T8/ELEC	1	89		No Upgrade	1	89	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
12	5	Stock room	8	1924	4H' EE/STD	1	160		4L4' T8/ELEC	1	110	0.05	96	\$90.00	\$16.35	5.5	OSW	1	77	\$200.00	\$13.08	15.3	\$15.00	\$20.00	149	\$255.00	\$25.35	10.1				
13	6	Stock room	8	1924	60W INCANDESC	1	60		13W CF/SI	1	15	0.045	87	\$6.00	\$14.72	0.4		0	\$0.00	\$0.00		\$0.00	\$0.00	87	\$6.00	\$14.72	0.4					
14	7	Office Area	8	1924	2L8' EE/STD	4	552		2L8' T8/ELEC	4	472	0.08	154	\$320.00	\$26.17	12.2		0	\$0.00	\$0.00		\$60.00	\$0.00	154	\$260.00	\$26.17	9.9					
15	9	Twp. Committee Office	8	1924	2H' EE/STD	4	320		2L4' T8/ELEC	4	244	0.076	146	\$240.00	\$24.86	9.7		0	\$0.00	\$0.00		\$60.00	\$0.00	146	\$180.00	\$24.86	7.2					
16	3	Hallway	12	2886	4L4' T8/ELEC	1	110		No Upgrade	1	110	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
17	7	Zoning Waiting Area	8	1924	2L8' EE/STD	2	278		2L8' T8/ELEC	2	236	0.04	77	\$180.00	\$13.08	12.2		0	\$0.00	\$0.00		\$30.00	\$0.00	77	\$130.00	\$13.08	9.9					
18	7	Office	8	1924	2L8' EE/STD	4	552		2L8' T8/ELEC	4	472	0.08	154	\$320.00	\$26.17	12.2	OSW	1	266	\$200.00	\$45.14	4.4	\$60.00	\$20.00	381	\$440.00	\$64.76	6.8				
19	6	Hallway	12	2886	60W INCANDESC	2	120		13W CF/SI	2	30	0.09	260	\$12.00	\$44.16	0.3		0	\$0.00	\$0.00		\$0.00	\$0.00	260	\$12.00	\$44.16	0.3					
20	3	Meeting Room	8	1924	4L4' T8/ELEC	6	660		No Upgrade	6	660	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
21	6	Store Room	8	1924	60W INCANDESC	1	60		13W CF/SI	1	15	0.045	87	\$6.00	\$14.72	0.4		0	\$0.00	\$0.00		\$0.00	\$0.00	87	\$6.00	\$14.72	0.4					
22	EMS Section																		0	\$0.00	\$0.00			\$0.00								
23	7	Garage Bay	8	1924	2L8' EE/STD	15	2070		2L8' T8/ELEC	15	1770	0.3	577	\$1,200.00	\$98.12	12.2		0	\$0.00	\$0.00		\$225.00	\$0.00	577	\$975.00	\$98.12	9.9					
24	8	Storage Closet	0.5	120.25	13W CF/SI	1	15		No Upgrade	1	15	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
25	6	Furnace Room / Clothing storage	8	1924	60W INCANDESC	1	60		13W CF/SI	1	15	0.045	87	\$6.00	\$14.72	0.4		0	\$0.00	\$0.00		\$0.00	\$0.00	87	\$6.00	\$14.72	0.4					
26	7	2nd Bay	8	1924	2L8' EE/STD	14	1932		2L8' T8/ELEC	14	1652	0.28	539	\$1,120.00	\$91.58	12.2		0	\$0.00	\$0.00		\$210.00	\$0.00	539	\$910.00	\$91.58	9.9					
27	9	2nd Bay	8	1924	2H' EE/STD	3	240		2L4' T8/ELEC	3	183	0.057	110	\$180.00	\$18.64	9.7		0	\$0.00	\$0.00		\$45.00	\$0.00	110	\$135.00	\$18.64	7.2					
28	12	Medical Supply Room	8	1924	1H' EE/STD	1	50		1L4' T8/ELEC	1	31	0.019	37	\$50.00	\$6.21	8.0		0	\$0.00	\$0.00		\$15.00	\$0.00	37	\$35.00	\$6.21	5.6					
29	5	Restroom	8	1924	4H' EE/STD	1	160		4L4' T8/ELEC	1	110	0.05	96	\$90.00	\$16.35	5.5	OSR	1	77	\$260.00	\$13.08	19.9	\$15.00	\$35.00	149	\$300.00	\$25.35	11.8				
30	5	Kitchen	8	1924	4H' EE/STD	4	640		4L4' T8/ELEC	4	440	0.2	385	\$360.00	\$65.42	5.5		0	\$0.00	\$0.00		\$60.00	\$0.00	385	\$300.00	\$65.42	4.6					
31	5	Kitchen Store Room	8	1924	4H' EE/STD	1	160		4L4' T8/ELEC	1	110	0.05	96	\$90.00	\$16.35	5.5		0	\$0.00	\$0.00		\$15.00	\$0.00	96	\$75.00	\$16.35	4.6					
32	5	Lounge	8	1924	4H' EE/STD	9	1440		4L4' T8/ELEC	9	990	0.45	866	\$810.00	\$147.19	5.5		0	\$0.00	\$0.00		\$135.00	\$0.00	866	\$675.00	\$147.19	4.6					
33	9	Extra Room/ Office	8	1924	2H' EE/STD	1	80		2L4' T8/ELEC	1	61	0.019	37	\$60.00	\$6.21	9.7		0	\$0.00	\$0.00		\$15.00	\$0.00	37	\$45.00	\$6.21	7.2					
34	10	Exit	24	8760	15W Exit	3	45		LED	3	6	0.039	342	\$120.00	\$58.08	2.1		0	\$0.00	\$0.00		\$30.00	\$0.00	342	\$90.00	\$58.08	1.5					
35	13	Exterior	7	2555	150W HPS/BALLA	4	760		No Upgrade	4				\$1,000.00				0	\$0.00	\$0.00		\$0.00	\$0.00		\$0.00	\$0.00						
36	14	Exterior	7	2555	70W HPS/BALLA	2	184		No Upgrade	2	184	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00		\$0.00	\$0.00	0	\$0.00	\$0.00						
37	15	Exterior	7	2555	100W INCANDESC	2	200		26W CF/HW	2	56	0.144	368	\$20.00	\$62.55	0.3		0	\$0.00	\$0.00		\$0.00	\$0.00	368	\$20.00	\$62.55	0.3					

Appendix B: Third Party Energy Suppliers (ESCOs)

PSE&G SERVICE TERRITORY

Last Updated: 12/09/09

***CUSTOMER CLASS - R – RESIDENTIAL C – COMMERCIAL I -INDUSTRIAL**

Supplier	Telephone & Web Site	*Customer Class
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	877-977-2636 www.americanpowernet.com	C ACTIVE
Commerce Energy, Inc. 4400 Route 9 South, Suite 100 Freehold, NJ 07728	(800) 556-8457 www.commerceenergy.com	C ACTIVE
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway 38 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com	C ACTIVE
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 www.newenergy.com	C/I ACTIVE
Credit Suisse, (USA) Inc. 700 College Road East Princeton, NJ 08450	212-538-3124 www.creditsuisse.com	C ACTIVE
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com	C/I ACTIVE
FirstEnergy Solutions 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 www.fes.com	C/I ACTIVE
Glacial Energy of New Jersey, Inc. 207 LaRoche Avenue Harrington Park, NJ 07640	1-877-569-2841 www.glacialenergy.com	C/I ACTIVE

Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	C/I ACTIVE
Integrus Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	1-877-763-9977 www.integrusenergy.com	C/I ACTIVE
Liberty Power Delaware, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866)769-3799 www.libertypowercorp.com	C/I ACTIVE
Liberty Power Holdings, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866) 769-3799 www.libertypowercorp.com	C/I ACTIVE
Linde Energy Services 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.linde.com	C/I ACTIVE
Palmco Power NJ, LLC One Greentree Centre 10000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	C/I ACTIVE
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) ENERGY-9 (363-7499) www.pepco-services.com	C/I ACTIVE
Sempra Energy Solutions The Mac-Cali Building 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.semprasolutions.com	C/I ACTIVE
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.southjerseyenergy.com	C/I ACTIVE
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com	C/I ACTIVE

Strategic Energy, LLC 55 Madison Avenue, Suite 400 Morristown, NJ 07960	(888) 925-9115 www.sel.com	C/I ACTIVE
Suez Energy Resources NA, Inc. 333 Thornall Street, 6th Floor Edison, NJ 08837	(888) 644-1014 www.suezenergyresources.com	C/I ACTIVE
UGI Energy Services, Inc. 704 East Main Street Suite 1 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com	C/I ACTIVE

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Supplier	Telephone & Web Site	Customer Class
Cooperative Industries 412-420 Washington Avenue Belleville, NJ 07109	800-6-BUYGAS (6-289427) www.cooperativenet.com	C/I ACTIVE
Direct Energy Services, LLP 120 Wood Avenue, Suite 611 Iselin, NJ 08830	866-547-2722 www.directenergy.com	R/C/I INACTIVE
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	800-805-8586 www.gesc.com	R/C/I ACTIVE
UGI Energy Services, Inc. d/b/a GASMARK 704 East Main Street, Suite 1 Moorestown, NJ 08057	856-273-9995 www.ugienergyservices.com	C/I ACTIVE
Great Eastern Energy 116 Village Riva, Suite 200 Princeton, NJ 08540	888-651-4121 www.greateastern.com	C/I ACTIVE

Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	C/I ACTIVE
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	800-724-1880 www.intelligentenergy.org	R/C/I ACTIVE
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	877-750-7046 www.metromediaenergy.com	C/I ACTIVE
MxEnergy, Inc. 510 Thornall Street, Suite 270 Edison, NJ 088327	800-375-1277 www.mxenergy.com	R/C ACTIVE
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	800-840-4GAS www.natgasco.com	C ACTIVE
Palmco Energy NJ, LLC One Greentree Centre 10000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	C/I ACTIVE
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	800-363-7499 www.pepco-services.com	C/I ACTIVE

PPL EnergyPlus, LLC 811 Church Road - Office 105 Cherry Hill, NJ 08002	800-281-2000 www.pplenergyplus.com	C/I ACTIVE
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	800-756-3749 www.sjindustries.com/sje.htm	C/I ACTIVE
Woodruff Energy 73 Water Street Bridgeton, NJ 08302	800- 557-1121 www.woodruffenergy.com	R/C/I ACTIVE