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*March 29th, 2010*

***Local Government Energy Program  
Final Energy Audit Report***

*For*

***Evesham Fire Department  
Kings Grant Fire Station 223  
150 Merchants Way  
Evesham, NJ 08053***

***Project Number: LGEA36***



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## **INTRODUCTION**

On January 7<sup>th</sup>, Steven Winter Associates, Inc. (SWA) and PMK performed an energy audit and assessment of the Evesham Firehouses located in Evesham, 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 Kings Grant Fire Station 223 is a one story structure built in 1992 and is approximately 7,750 sq. ft. The building consists of a four bay engine garage a training room, kitchen, and eating area a fitness room and dispatch area.

Kings Grant firehouse is occupied from 24 hours a day, seven days a week by six to thirty employees. During the night hours, several volunteers occupy these buildings. These hours and occupancy rates are maintained year round.

Energy data and building information collected in the field were analyzed to determine the baseline energy performance of each building. Using spreadsheet-based calculation methods, SWA/BSG-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 Kings Grant Fire Station 223 located at 150 Merchants Way, in Evesham, NJ, 08053.

Based on the field visit performed by Steven Winter Associates (SWA) and BSG-PMK staff on January 7<sup>th</sup>, 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, March, 2008 through February, 2009, the building consumed a total of 61,680 kWh of electricity for a total cost of \$10,703 and 5,433 therms of natural gas, for a total cost of \$7,483.

With electricity and natural gas combined, the building consumed 754 MMBtus of energy at a total cost of \$18,186.

SWA/BSG-PMK has entered energy information about the Evesham firehouse building 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-Fire Station/Police Station" in the Portfolio Manager system

Based on the assessment of the Evesham Kings Grant Firehouse, SWA/BSG-PMK has separated the recommendations into three categories (See Section 4 for more details). These are summarized as follows:

### Recommendations

#### Category I Recommendations: Capital Improvements

Based on the results of SWA/BSG-PMK's survey, the water heater at this Station has passed its useful life and it is recommended that it be replaced with new, higher efficient unit.

#### Category II Recommendations: Operations & Maintenance

Based on the results of the SWA/BSG-PMK's survey, there are no Repair and Maintenance recommendations.

#### Category III Recommendations: Energy Conservation Measures

At this time, SWA/BSG-PMK recommends a total of **4** Energy Conservation Measures (ECMs) for the Evesham firehouses (Evesham) that are summarized in the following tables. The total investment cost for these ECMs, with incentives, is **\$16,068**. SWA/BSG-PMK estimates a first year savings of **\$4,922** with an aggregated simple payback of **3.3 years**. SWA/BSG-PMK estimates that implementing the highly recommended ECMs will reduce the carbon footprint of the firehouse by **40,548 lbs of CO<sub>2</sub>**.

There are various incentives that the Evesham Fire District could apply for that could also help lower the cost of installing the ECMs. SWA/BSG-PMK recommends that Evesham Fire District apply for the NJ SmartStart and Direct Install 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.

Using an average of \$0.150/kWh the Kings Grant Fire Station could save approximately \$1,451 on their electric bills. The Fire District already purchases natural gas for \$1.377/therm which is lower than the average rate of \$1.550/therm. Appendix B contains a complete list of third party energy suppliers.

## ECM SUMMARY TABLES

ROI: Return on Investment (%)

**Assumptions:**

Discount rate: 3.2% per DOE FEMP guidelines      Electricity rate: \$0.17 \$/kWh  
 Energy price escalation rate: 0% per DOE FEMP guidelines      Gas rate: \$1.38 \$/therm

Avg. Annual Demand: 0.00450

Area of Building (SF)

7,750

**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 <sub>2</sub> Reduced, lbs/yr
1	Lighting Upgrades	Empirical Data	\$4,728	\$960	\$3,768	13,003	4.88	0	5.72	\$0	\$2,211	15	\$26,011	1.70	590%	39%	59%	\$22,621	17,814
2	High-Efficiency Modulating Furnaces	Similar Projects	\$27,500	\$22,000	\$5,500	0	0.00	1,055	13.61	\$0	\$1,456	18	\$19,687	3.78	258%	14%	26%	\$14,521	12,342
3	Replace Garage Unit Heaters	Similar Projects	\$9,000	\$7,200	\$1,800	0	0.00	479	6.17	\$0	\$660	13	\$6,934	2.73	285%	22%	36%	\$5,223	5,598
TOTAL			\$41,228	\$30,160	\$11,068	13,003	4.88	1,533	25.51	\$0.00	\$4,327	-	\$52,632	2.56	-	-	-	\$42,365	35,754

**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, \$	CO <sub>2</sub> Reduced, lbs/yr
4	Upgrade Condensing Units	Similar Projects	\$25,000	\$20,000	\$5,000	3,499	1.31	0	1.54	\$0	\$595	15	\$6,999	8.41	40%	3%	8%	\$2,101	4,793
TOTAL			\$25,000	\$20,000	\$5,000	3,499	1.31	0	1.54	\$0.00	\$595	-	\$6,999	8.41	-	-	-	\$2,101	4,793

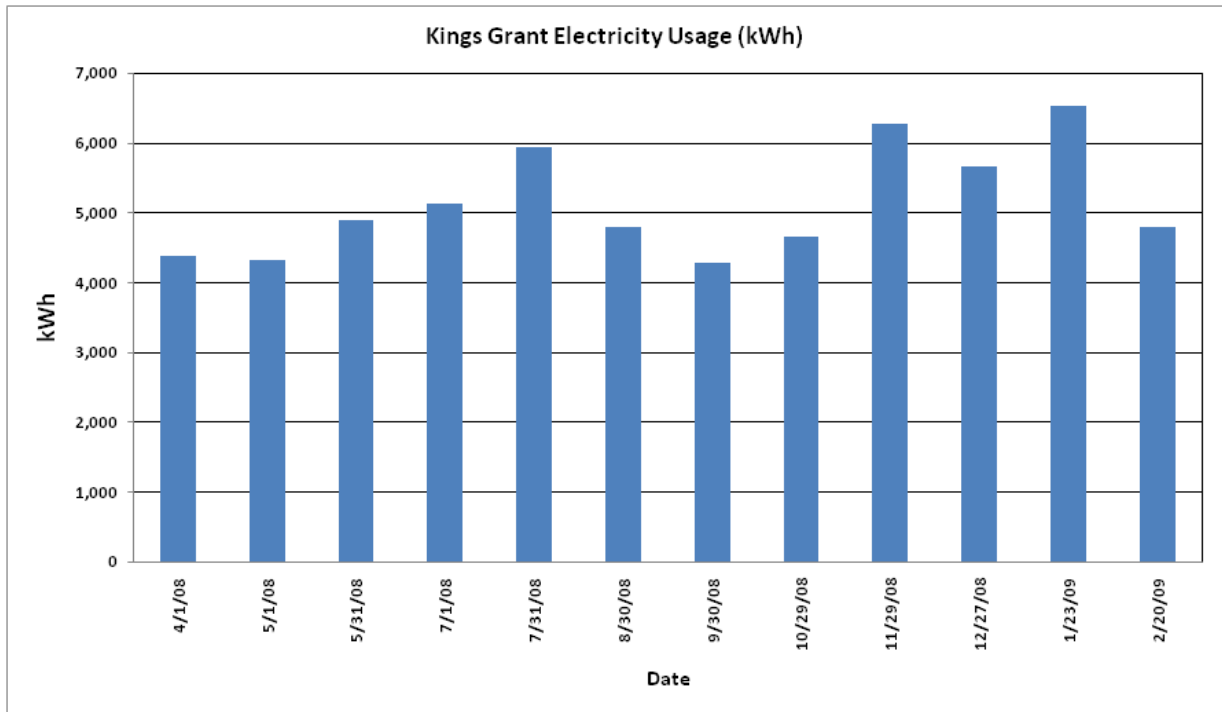
# 1. HISTORIC ENERGY CONSUMPTION

## 1.1. Energy usage and cost analysis

SWA/BSG-PMK analyzed utility bills that were received from the utility companies supplying the Evesham firehouse with electric and natural gas from March, 2007 to February, 2009.

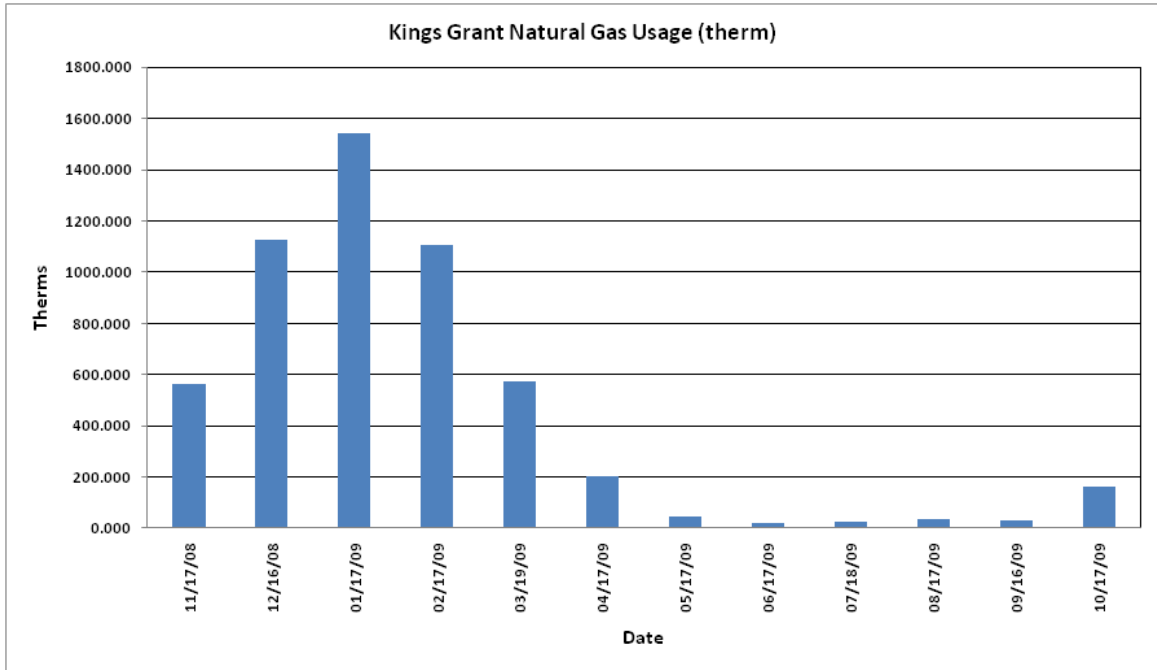
Electricity – The Kings Grant Fire Station is currently served by one electric meter. The Kings Grant Fire Station currently purchases electricity from PSE&G at an average rate of **\$0.174/kWh** based on 12 months of utility bills from March 2008 to February 2009. The Kings Grant Fire Station building consumed **approximately 61,680 kWh or \$10,703 worth of electricity** in the previous year. The average monthly demand was 23.1 kW and the annual peak demand was 27.0

The following chart shows electricity usage for the building based on utility bills for the specified analysis period.



Natural Gas –The Kings Grant Fire Station building is currently served by one meter for natural gas. The Kings Grant Fire Station currently receives natural gas from South Jersey Gas at **an average aggregated rate of \$1.377/therm** based on 12 months of utility bills for November 2008 to October 2009. The Kings Grant Fire Station consumed **approximately 5,433 therms or \$7,483 worth of natural gas** in the previous year.

The following charts show the natural gas usage based on utility bills for specified analysis period.



The natural gas usage mimics seasonal needs for heating the buildings showing that natural gas is used primarily for heating.

### 1.2. Utility rate

The Kings Grant Fire Station currently receives electricity from PSE&G at a general service market rate for electricity use (kWh) with (kW) demand charge. The Kings Grant Fire Station currently pays an average rate of approximately \$0.174/kWh based on the most recent 12 months of utility bills.

The Kings Grant Fire House currently receives natural gas supply and delivery from South Jersey Gas at a general service market rate for natural gas (therms). There is one gas meter that provides natural gas service to the Kings Grant firehouse building currently. The average aggregated rate (supply and transport) for the meter is approximately \$1.377/therm based on 12 months of utility bills for November 2008 to October 2009.

### 1.3. Energy benchmarking

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

Buildings achieving an Energy Star rating of 75 or higher and professionally verified to meet current indoor environmental standards are eligible to apply for the Energy Star award and receive the Energy Star plaque to convey superior performance to students, parents, taxpayers, and employees. These ratings also greatly help when applying for Leadership in Energy and Environmental Design (LEED) building certification to the United States Green Building Council (USGBC).

The Site Energy Use Intensity is 99.0 kBtu/sqft/yr compared to the national average of Fire Station/Police Station consuming 78.0 kBtu/sqft/ yr. Implementing this report's highly recommended Energy Conservations Measures (ECMs) will reduce use by approximately 27.05 kBtu/sq.ft./yr.

[http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager)

**Username: eveshamfire-rescue**

**Password: eveshamfire**



## STATEMENT OF ENERGY PERFORMANCE King's Grant Fire Station

Building ID: 2223272  
For 12-month Period Ending: December 31, 2009<sup>1</sup>  
Date SEP becomes ineligible: N/A

Date SEP Generated: March 12, 2010

**Facility**  
King's Grant Fire Station  
150 Merchants Way  
Marlton, NJ 08053

**Facility Owner**  
Evesham Township Fire District No. 1  
984 Tuckerton Rd  
Evesham, NJ 08053

**Primary Contact for this Facility**  
Paul E. Thomas, Jr.  
984 Tuckerton Rd  
Evesham, NJ 08053

**Year Built:** 1992  
**Gross Floor Area (ft<sup>2</sup>):** 7,750

**Energy Performance Rating<sup>2</sup> (1-100)** N/A

### Site Energy Use Summary<sup>3</sup>

Electricity - Grid Purchase(kBtu)	224,373
Natural Gas (kBtu) <sup>4</sup>	543,300
Total Energy (kBtu)	767,673

### Energy Intensity<sup>5</sup>

Site (kBtu/ft <sup>2</sup> /yr)	99
Source (kBtu/ft <sup>2</sup> /yr)	170

### Emissions (based on site energy use)

Greenhouse Gas Emissions (MtcO <sub>2</sub> e/year)	63
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### Electric Distribution Utility

Public Service Elec & Gas Co

### National Average Comparison

National Average Site EUI	78
National Average Source EUI	157
% Difference from National Average Source EUI	8%
Building Type	Fire Station/Police Station

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 Standards<sup>6</sup> 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:

- 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.
- 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.
- Values represent energy consumption, annualized to a 12-month period.
- 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.
- Values represent energy intensity, annualized to a 12-month period.
- 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 8 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 (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460.

EPA Form 5900-16

## 2. FACILITY AND SYSTEMS DESCRIPTION

### 2.1. Building Characteristics

The Kings Grant Fire Station 223 is a one story structure built in 1992 and is approximately 7,750 sq. ft. The building consists of a four bay engine garage a training room, kitchen, and eating area a fitness room and dispatch area.

### 2.2. Building Occupancy Profiles

This building is occupied 24 hours a day, seven days a week. During the night hours, several volunteers occupy these buildings. These hours and occupancy rates are maintained year round. There are approximately 25 volunteer fire and emergency medical personnel assigned to this station.

### 2.3. Building envelope

#### 2.3.1. Exterior walls

The walls are constructed with structural studs and insulated with R-19 batt insulation. The exterior is finished with sheathing and vinyl siding. The engine garage walls are constructed of uninsulated concrete masonry block (CMU).

#### 2.3.2. Roof

The pointed roof is an asphalt 15# Shingled roof with 1/2" sheathing. The roof is found to be in good condition with no signs of improper drainage or water damage.



#### 2.3.3. Base

The base of the building consists of a reinforced poured concrete slab with no penetrations or basement. The base was found to be in good condition.

#### 2.3.4. Windows

The windows are double pane thermal casement windows with approximately 5/8" of space between the panes. None of the windows appear to be damaged or in need of replacing.



#### 2.3.5. Exterior doors

The front doors of the building are thermal, double pane glass set in an aluminum frame. The door is medium style with weather stripping. There are four 12' overhead, bay doors on the engine room, all were found to be in good condition.

#### 2.3.6. Building air tightness

The building's air tightness is good. There are no areas other than the first set of front doors that require weather stripping repairs. There were no visual signs of infiltration

## 2.4. HVAC systems

### 2.4.1. Heating

The heat in the building is provided by three Lennox gas fired forced air furnaces, two with an input of 125,000 BTU/H along with a 55,000 BTU/H. The garage areas are heated by six gas-fired 40,000 BTU/H radiant unit heaters. (shown right)



### 2.4.2. Cooling

The cooling in this building is provided by two Lennox, one York and one LG split system condensing units, 24,000 BTU/H, 60,000 BTU/H, 60,000 BTU/H, and 11,500 BTU/H respectively.

### 2.4.3. Ventilation

The building has one upblast exhaust fan from the bathrooms and vent stacks on the roof. The garage area is ventilated by ceiling fans. The fire truck exhaust is piped below the floor.

### 2.4.4. Domestic Hot Water

The building's domestic hot water is supplied by a gas fired 50 gallon Bradford White Corporation Energy Saver water heater unit. The unit is fueled by natural gas and services the showers and sinks. (pictured here)



## 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 will result in an annual savings .

Category III Recommendation - ECM #1: Recommend upgrading all T-12 lighting fixtures with magnetic ballasts to T-8 fixtures with electronic ballasts, as well as various other lighting upgrades outlined in Appendix A

### 2.5.2. Elevators

There are no elevators at the Kings Grant fire station

### 3. EQUIPMENT LIST

Building System	Description	Locations	Model #	Fuel	Space Served	Estimate d. Remaining Useful Life %
Heating	Forced-air furnace, 125 MBH, 80% efficient	Attic	Lennox M# GH1904-5-125, S# 4691L03876	Natural Gas	Entire Building	0%
Heating	Forced-air furnace, 125 MBH, 80% efficient	Attic	Lennox M# GH1904-5-125, S# 4691L03875	Natural Gas	Entire Building	0%
Heating	Forced-air furnace, 55 MBH, 80% efficient	Attic	Lennox M# G1202-55-7, S# 5891L01789	Natural Gas	Entire Building	0%
Heating	(6) 40 MBH unit heaters	Garage	No nameplate	Natural Gas	Garage	0%
Cooling	5-ton condensing unit, feeds cooling coil in furnace	Outside	York M# H1DA060525A, S# EH6M435109	Electricity	Entire Building	0%
Cooling	5-ton condensing unit, feeds cooling coil in furnace	Outside	Lennox M# HS24-653-1Y, S# 5192B08451	Electricity	Entire Building	0%
Cooling	2-ton condensing unit, feeds cooling coil in furnace	Outside	Lennox M# HS24-261-1P	Electricity	Entire Building	0%
Cooling	1-ton split-system condensing unit	Outside	LG M# LAU121CNM, S# 612KAPB00016	Electricity	Office	80%
	Split-system air-handler	Wall-mounted	LG M# LAN121CNM			80%
Domestic Hot Water	Water heater, 50 gallons, 60 MBH	Basement	Bradford White M# T5-I-5035LN-0, S# JB0104618	Natural Gas	Sinks, showers	0%
Venilation	Centrifugal upblast exhaust fan	Roof above bathrooms	No nameplate	Electricity	Bathrooms, garage	0%

**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/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**

Based on the results of SWA/BSG-PMK’s survey, the water heater at this Station has passed its useful life and it is recommended that it be replaced with new, higher efficient unit.

**Category II Recommendations: Operation & Maintenance**

Based on the results of the SWA/BSG-PMK’s survey, there are no Repair and Maintenance recommendations.

**Category III Recommendations: Energy Conservation Measures**

**Summary Table**

<b>ECM#</b>	<b>Description</b>
1	Lighting System Upgrades
2	Install High Efficiency Modulating Furnaces
3	Replace Garage Unit Heaters
4	Upgrade Condensers

## ECM #1: Lighting Upgrades & Occupancy Sensors

### Description:

Lighting at the Kings Grant Fire Station primarily consists of standard efficient fixtures with T12 lamps and magnetic ballasts. SWA/BSG-PMK recommends replacing the incandescent lamps with longer lasting, more efficient compact fluorescent lamps. The fixtures with T12 fluorescent lamps and magnetic ballast should be retrofitted with T8 lamps and electronic ballasts. 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
<b>Cost</b>	\$4,728.00	\$0.00	\$4,728.00
<b>Rebate</b>	\$960.00	\$0.00	\$960.00
<b>Net Cost</b>	\$3,768.00	\$0.00	<b>\$3,768.00</b>
<b>Savings (kWh)</b>	13,003	0	<b>13,003</b>
<b>Savings (\$)</b>	\$2,210.54	\$0.00	<b>\$2,210.54</b>
<b>Payback</b>	1.7		<b>1.7</b>

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	kWh Demand Reduction/Mo	Therm, 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 <sub>2</sub> Reduced, lbs/yr
1	Lighting Upgrades	Empirical Data	\$4,728	\$960	\$3,768	13,003	4.88	0	5.72	\$0	\$2,211	15	\$26,011	1.70	590%	39%	59%	\$22,621	17,814

**Assumptions:**

The electric cost used in this ECM was \$0.17/kWh, which was the facilities' average rate for the 12-month period between 2008 through 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 \$960.

## ECM#2: High-Efficiency Modulating Furnaces

### Description:

Kings Grant Fire House is heated by three Lennox gas-fired forced-air furnaces, two with a heating capacity of 125 MBH and the other with a heating capacity of 55 MBH. They have all surpassed their 18-year useful life, and should be replaced. The units were all 80% efficient at the time of their purchase, but due to their age and condition, can be assumed to be 80% of their original efficiency, or 64%. High-efficiency modulating furnaces are available, which have efficiencies of 98%.

### Installation cost:

Estimated installed cost: (2) 125 MBH furnaces, \$10,000 each; (1) 55 MBH furnace, \$7,500; \$27,500 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, \$	CO <sub>2</sub> Reduced, lbs/yr
2	High-Efficiency Modulating Furnaces	Similar Projects	\$27,500	\$22,000	\$5,500	0	0.00	1,055	13.61	\$0	\$1,456	18	\$19,687	3.78	258%	14%	26%	\$14,521	12,342

### Assumptions:

The cost per therm of natural gas that was used, taken from twelve months of Kings Grant Fire House's energy bills, was \$1.38. Also taken from the energy bills was the annual heating consumption for all heating units in the building, 5,433 therms. There are nine gas-consuming units in the building, so the gas consumption must be divided between these units. An accurate way to go about this is to add the heating capacities of all nine units, and make the percentage of the total gas consumption that each unit consumed would be proportional to the percentage of the cumulative heating capacities that each unit represents:

Unit	Heating Capacity	% of Total Capacity	Gas Usage (therms)	Heating Efficiency	
	(MBH)			(original)	(current)
Lennox Furnace	125	23%	1,246	80%	64%
Lennox Furnace	125	23%	1,246	80%	64%
Lennox Furnace	55	10%	548	80%	64%
6 Unit Heaters	240	44%	2,393	80%	64%
Totals	545	100%	5,433	-	-

The saving was calculated using the following series of equations:

Current gas input, all 3 units: 1,246 therms+1,246 therms+548 therms=3,040 therms

Current/proposed gas output: 3,040 therms×64%=1,946 therms

Proposed gas input:  $\frac{1,946 \text{ therms}}{98\%} = 1,986 \text{ therms}$

Savings: 3,040 therms-1,986 therms=1,055 therms

**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, or \$22,000 for this measure.

### ECM#3: Replace Garage Unit Heaters

#### Description:

The garage is heated by six gas-fired unit heaters, all with a heating capacity of 40 MBH. They have all surpassed their 13-year useful life, and should be replaced. The units were all 80% efficient at the time of their purchase, but due to their age and condition, can be assumed to be 80% of their original efficiency, or 64%. The proposed units will be 80% efficient as well.

#### Installation cost:

Estimated installed cost: \$1,500 each, \$9,000 total  
 Source of cost estimate: Similar projects, RS Means CostWorks 2009

#### Economics:

ECM #	ECM description	Source	Est. Installed Cost, \$	Est. Incentives, \$	Net Est. ECM Cost with Incentives, \$	kWh, 1st Yr Savings	kWh, 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 <sub>2</sub> Reduced, lbs/yr
3	Replace Garage Unit Heaters	Similar Projects	\$9,000	\$7,200	\$1,800	0	0.00	479	6.17	\$0	\$660	13	\$6,934	2.73	28.5%	22%	36%	\$5,223	5,598

#### Assumptions:

The cost per therm of natural gas that was used, taken from twelve months of Kings Grant Fire House's energy bills, was \$1.38. Also taken from the energy bills was the annual heating consumption for all heating units in the building, 5,433 therms. There are nine gas-consuming units in the building, so the gas consumption must be divided between these units. An accurate way to go about this is to add the heating capacities of all nine units, and make the percentage of the total gas consumption that each unit consumed would be proportional to the percentage of the cumulative heating capacities that each unit represents:

Unit	Heating Capacity	% of Total Capacity	Gas Usage (therms)	Heating Efficiency	
	(MBH)			(original)	(current)
Lennox Furnace	125	23%	1,246	80%	64%
Lennox Furnace	125	23%	1,246	80%	64%
Lennox Furnace	55	10%	548	80%	64%
6 Unit Heaters	240	44%	2,393	80%	64%
Totals	545	100%	5,433	-	-

The saving was calculated using the following series of equations:

Current gas input, all 6 units: 2,393 therms

Current/proposed gas output: 2,393 therms×64%=1,531 therms

Proposed gas input:  $\frac{1,531 \text{ therms}}{80\%} = 1,914 \text{ therms}$

Savings: 2,393 therms-1,914 therms=479 therms

**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, or \$7,200 for this measure.

## ECM#4: Upgrade Condensing Units

**Description:**

Cooling is provided to Kings Grant Fire House by two 5-ton condensing units and one 2-ton condensing unit, which feed cooling coils in the furnaces that were recommended for replacement in ECM #2, as well as a 1-ton split-system condensing unit. All condensing units, with the exception of the 1-ton unit, have passed their 15-year useful life, and should be replaced. Units are now available with Seasonal Energy Efficiency Ratios (SEERs) as high as 21. The SEER for the current units could not be found, but condensing units manufactured in the 1990’s would have SEERs around 12; due to the age and condition of the units, their SEER was assumed to be 80% of the original value, or 10.

**Installation cost:**

Estimated installed cost: (2) 5-ton units, \$10,000 each; (1) 2-ton unit, \$5,000 each; \$25,000 total  
 Source of Estimate: Similar Projects

**Economics:**

ECM #	ECM description	Source	Est. Installed Cost, \$	Est. Incentives, \$	Net Est. ECM Cost with Incentives, \$	kWh, 1st Yr Savings	kWh 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 <sub>2</sub> Reduced, lbs/yr
4	Upgrade Condensing Units	Similar Projects	\$25,000	\$20,000	\$5,000	3,499	1.31	0	1.54	\$0	\$595	15	\$6,999	8.41	40%	3%	8%	\$2,101	4,793

**Assumptions:**

Using the facility’s electricity bills from October, 2008 through November, 2009, it was determined that the cost of electricity is currently \$0.17/kWh. This ECM was calculated using 65 Deg. F as a change-over temperature from heating to cooling. The American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) estimates on average per year, 1,104 cooling degree-days for a region that only exceeds a dry-bulb temperature of 92°F for 0.4% of the year. Due to the fact that Kings Grant Fire House only operates 55 hours, or 33%, of the work week, only 33% of the 1,104 cooling degree days were used for these calculations. The desired indoor temperature during the cooling season was assumed to be 74°F.

The following equation, the degree-day equation for cooling systems, was used to calculate the electric consumptions of the current and proposed air-conditioners:

$$\frac{\text{Capacity} \times \text{Degree-Days} \times 24 \frac{\text{hours}}{\text{day}}}{1,000 \times \text{EER} \times (\text{Temp}_{0.4\%} - \text{Temp}_{\text{indoor}})} = \text{Electric Consumption (in kWh)}$$

**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, or \$20,000 for this measure.

## **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 roof of the Kings Grant firehouse. 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. A geothermal system would require the existing HVAC systems to be removed and replaced with a heat pump system. Large underground vertical or horizontal loop systems would need to be installed on the site in some cases beneath the existing concrete aprons and asphalt. The replacement of the existing and in some cases recently replaced air conditioning and heat unitary equipment would make this type of ECM not cost effective.

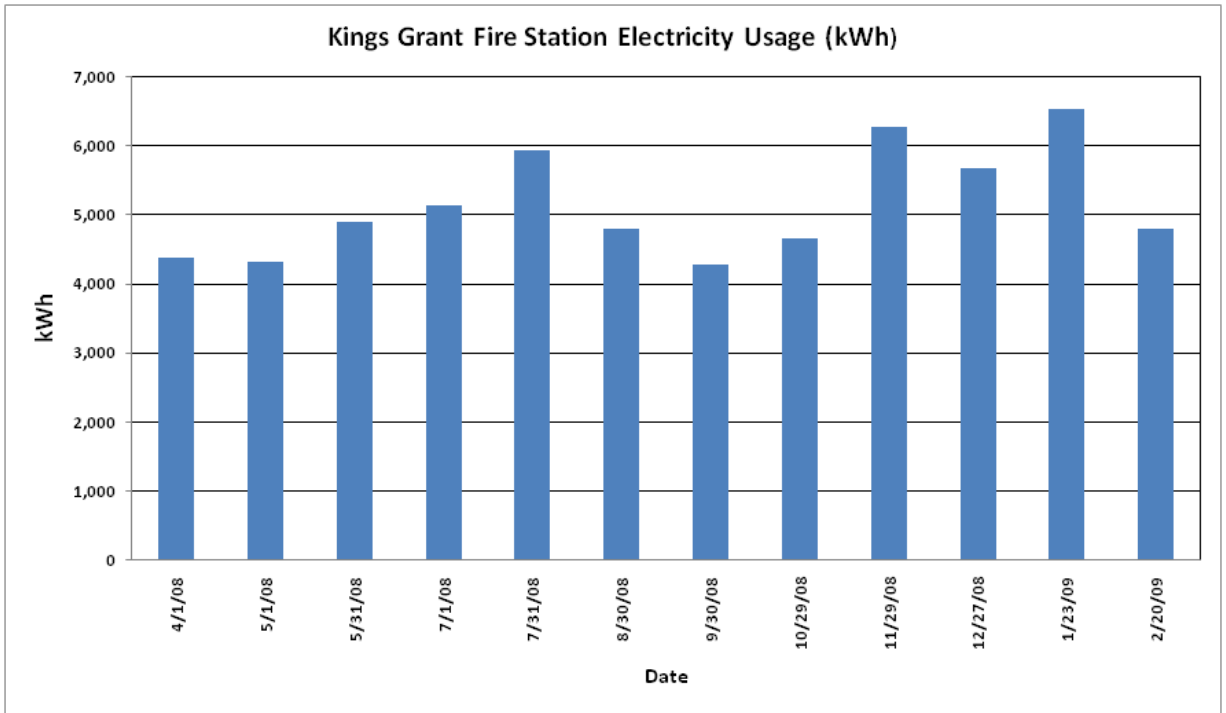
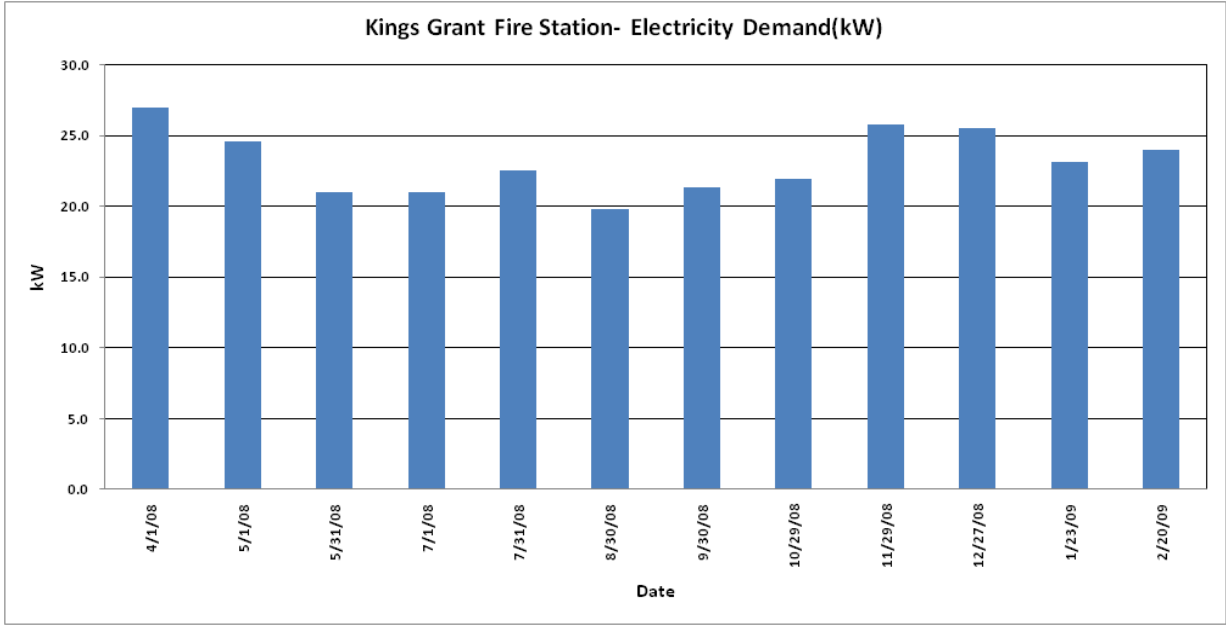
### **5.6. Wind**

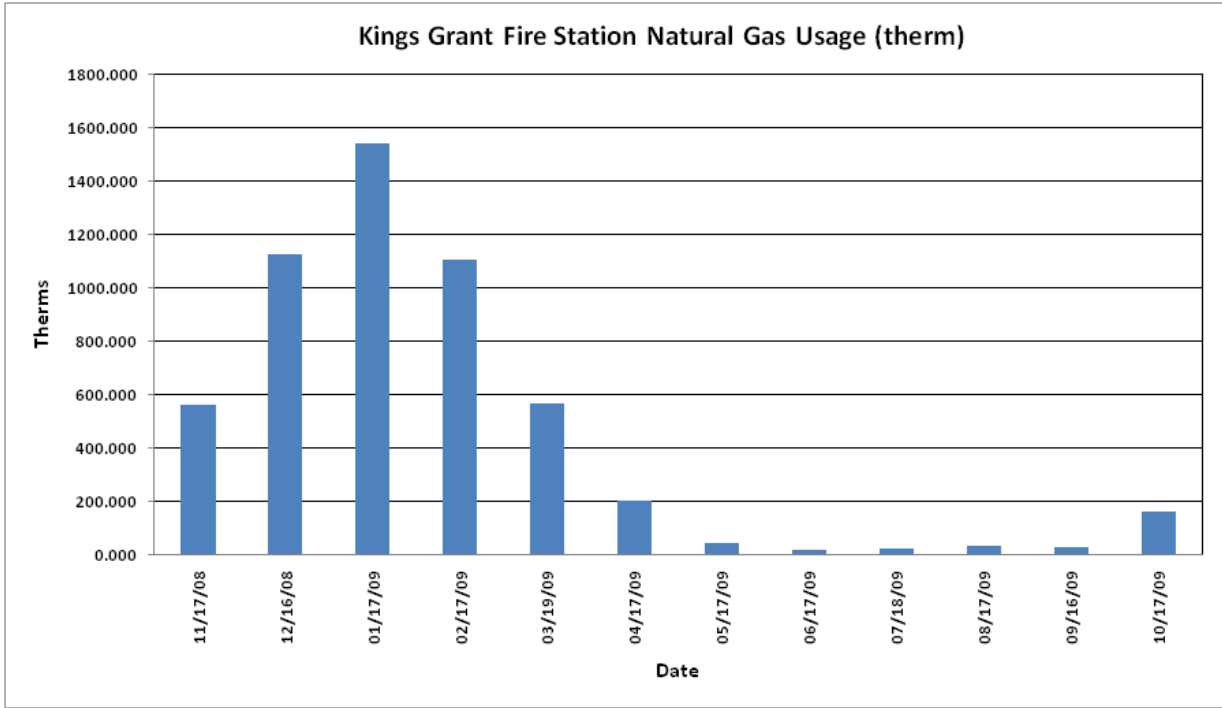
Wind turbine technologies of all shapes and sizes were considered for installation. Wind power production is not appropriate for this location because required land is not available for the wind turbine. The available wind energy resource is very low. A small residential model turbine or a vertical wind turbine could be installed on the roof of the building, but vertical wind turbines are not eligible for Renewable Energy Credits or REIP rebates, grants or incentives, and a small residential model would produce a negligible amount of power over a year and there would be a negative return on investment. Wind power is not recommended for this location along with the consideration of the buildings location in proximity to the surrounding neighborhood.

## **6. ENERGY PURCHASING AND PROCUREMENT STRATEGIES**

### **6.1. Energy Purchasing**

The average electrical peak demand for the previous year was 23.1 kW and the maximum peak demand was 27.0 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.

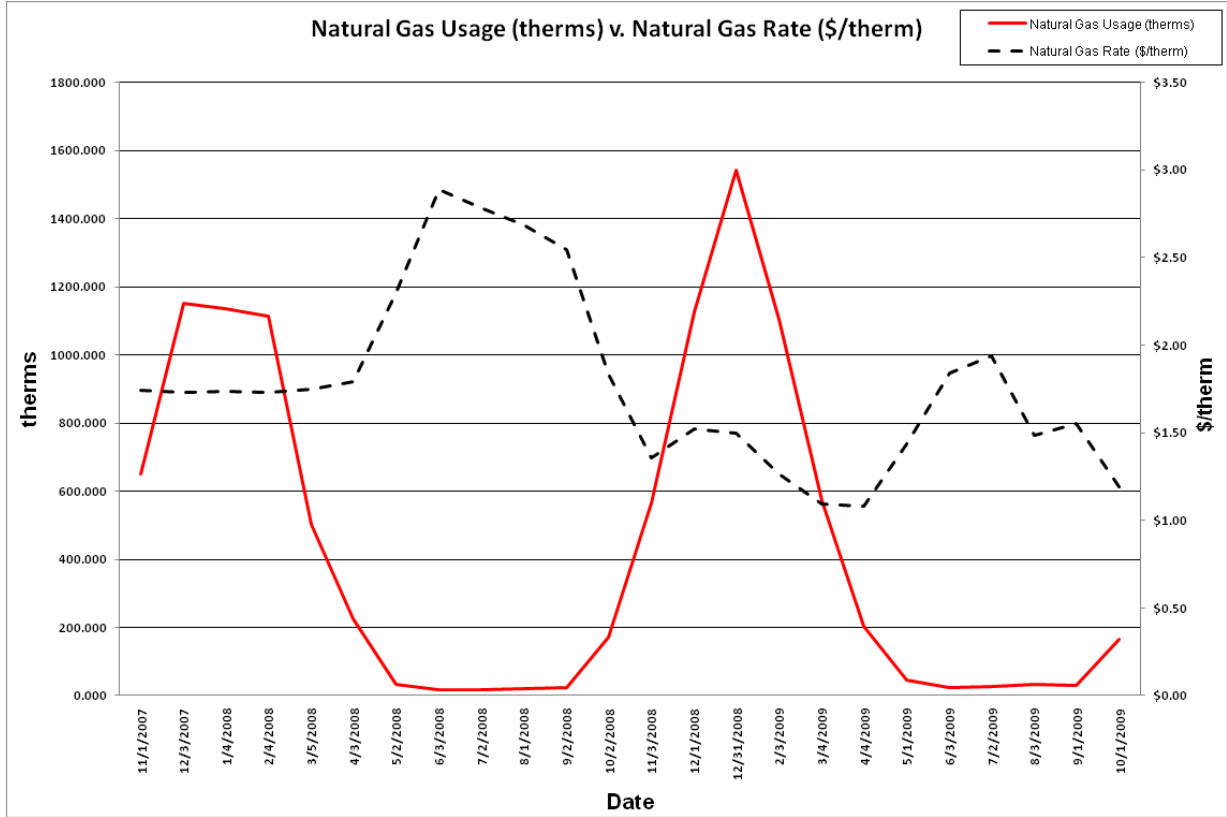




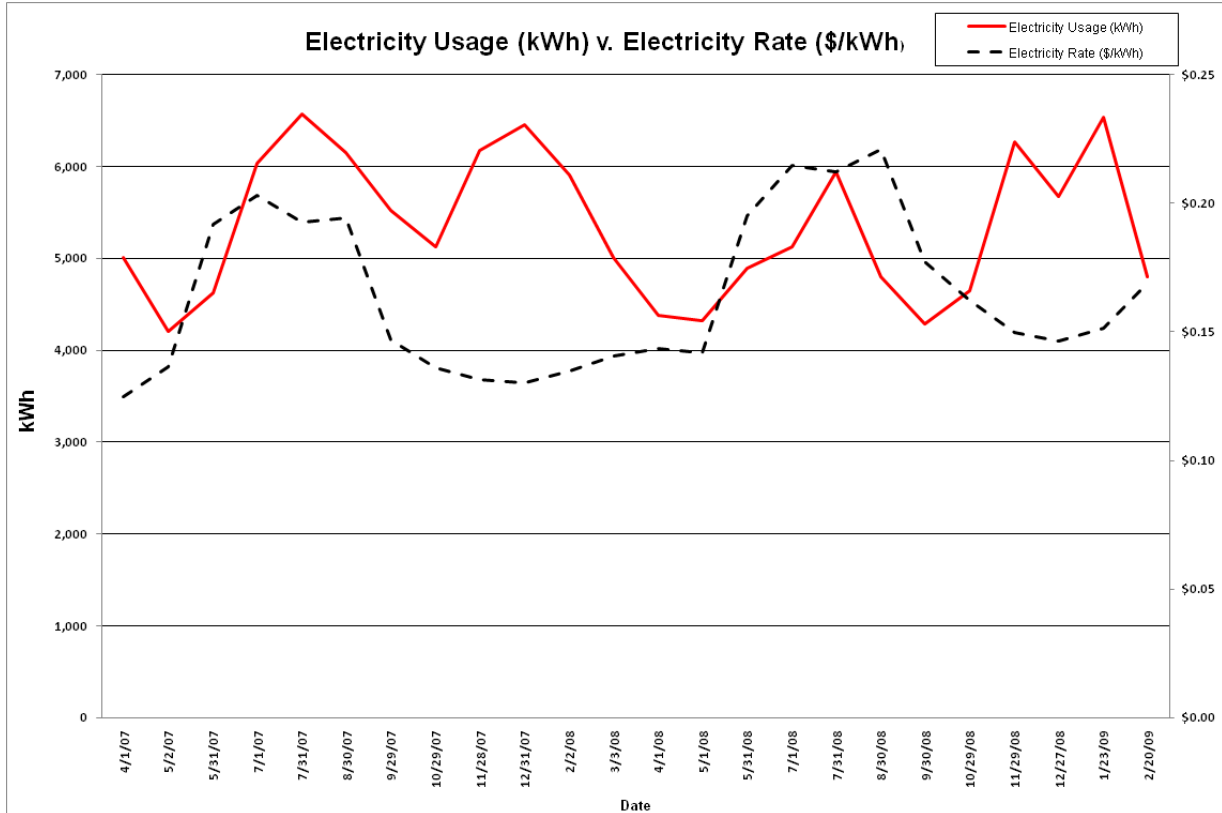
The natural gas usage shows that the most natural gas is consumed in the winter months, meaning the primary use of natural gas in this building is for heating.

## 6.2. Tariff analysis

Currently, natural gas is provided via one gas meter with South Jersey Gas acting as the distribution and supply service. The general service rate for natural gas charges a market-rate price based on use and Kings Grant Fire Station billing data does not breakdown demand costs for all periods. Demand prices are reflected in the utility bills and can be verified by observing the price fluctuations throughout the year.



The Kings Grant Fire Station is direct-metered (via one main meter) and currently purchases electricity from PSE&G at a general service rate. The general service rate for electric charges are market-rate based on use and the Kings Grant Fire Station billing data does not 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..



### 6.3. Energy Procurement strategies

Billing analysis shows large price fluctuations of over the course of the year for the Evesham firehouse natural gas and electric accounts. 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. Purchasing natural gas from an ESCO can reduce natural gas rate fluctuation and ultimately reduce the annual cost of energy for the school. Appendix B contains a complete list of third party energy suppliers.

Using an average of \$0.150/kWh the Kings Grant Fire Station could save approximately \$1,451 on their electric bills. The Fire District already purchases natural gas for \$1.377/therm which is lower than the average rate of \$1.550/therm. Appendix B contains a complete list of third party energy suppliers.

## 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

Township of Evesham  
Kings Grant Fire Station  
150 Merchants Way



Upgrade Code	Upgrade Description	Existing		Proposed		Lighting		
		Fixture	Watts	Fixture	Watts	Total # of Upgrades	Cost per Upgrade (\$)	SmartStart Rebate per Upgrade
1	(4) 34W T12 Lamps, Magnetic Ballasts / Replace with (4) 28W T8 Lamps, Electronic Ballast	4L4' EE/STD	160	4L4' T8/ELEC LO	99	43	\$80.00	\$15.00
2	(2) 40W T12 U-Tube Lamps, Magnetic Ballasts / Replace with (2) 32W T8 U-Tube Lamps, Electronic Ballast	2L22" STD/STD	94	2L22"	62	19	\$50.00	\$15.00
3	150W Incandescent Lamp / Replace with 44W Compact Fluorescent	150W INCANDESCENT	150	44W CF/SI	44	8	\$10.00	\$0.00
4	100W Incandescent Lamp / Replace with 26W Compact Fluorescent	100W INCANDESCENT	100	26W CF/SI	28	2	\$10.00	\$0.00
5	60W Incandescent Lamp / Replace with 15W Compact Fluorescent	60W INCANDESCENT	60	15W CF/SI	15	3	\$6.00	\$0.00
6	52W Incandescent Lamp / Replace with 13W Compact Fluorescent	52W INCANDESCENT	52	13W CF/SI	15	5	\$6.00	\$0.00
7	130W Incandescent Lamp / Replace with 44W Compact Fluorescent	125W INCANDESCENT	125	44W CF/SI	44	3	\$10.00	\$0.00
8	400W Metal Halide Lamp / No Upgrade	400W MH/BALLAST	445	No Upgrade	445	25	\$0.00	\$0.00
9	(1) 8' T2 Lamps, Magnetic Ballast / retrofit with a T8 Lamp, Electronic Ballast	1L8' EE/STD	83	1L8' T8/ELEC	67	0	\$40.00	\$15.00
10	32W Metal Halide Lamp	32W MH/BALLAST	40	No upgrade	40	8	\$0.00	\$0.00
11	60W Halogen Lamp	60W HALOGEN	60	No Upgrade	60	2	\$0.00	\$0.00
12	(1) 8' T2 Lamps, Magnetic Ballast / retrofit with a T8 Lamp, Electronic Ballast	1L8' EE/STD	83	1L8' T8/ELEC	67	2	\$80.00	\$15.00
13	400W High Pressure Sodium	400W HPS/BALLAST	450	No Upgrade	450	8	\$0.00	\$0.00
14	26W Compact Fluorescent	26W CF/SI	28	No Upgrade	28	7	\$0.00	\$0.00
15	200W Metal Halide	200W MH/BALLAST	200	No Upgrade	200	7	\$0.00	\$0.00

## Summary

	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
Cost	\$4,728.00	\$0.00	\$4,728.00
Rebate	\$960.00	\$0.00	\$960.00
Net Cost	\$3,768.00	\$0.00	\$3,768.00
Savings (kWh)	13,003	0	13,003
Savings (\$)	\$2,210.54	\$0.00	\$2,210.54
Payback	1.7		1.7

### Variables:

\$0.17	Avg. Electric Rate (\$/kWh)
	Avg. Demand Rate (\$/kW)
2860	Operating Hours/Year
8	Operating Hours/Work Day

### Assumptions:

25%	Occupancy Sensor Savings (Avg)
40%	Occupancy Sensor Savings(>Avg)

### Notes:

Seq. #	Upgrade Code	Room/Area	Hrs/Work Day	Hrs/Year	Existing				Proposed				kW Reduction	Lighting			Occupancy Sensors (ONLY)				SmartStart Rebate		Lighting & Occupancy Sensors			
					Fixture	Qty.	Watts	Foot Candles	Fixture	Qty.	Watts	Energy Savings, kWh		Cost (\$)	Savings (\$)	Payback (yrs)	Energy Savings, kWh	Cost (\$)	Savings (\$)	Payback (yrs)	Lighting	Sensors	Energy Savings, kWh	Post-Rebate Cost (\$)	Savings (\$)	Payback (yrs)
<b>Totals:</b>					27808		22990	4.818	13003	\$4,728.00	\$2,210.54	2.1	0	\$0.00	\$0.00	\$960.00	\$0.00	13003	\$3,768.00	\$2,210.54	1.7					
1	1	Office 1	8	2860	4L4' EE/STD	2	320		4L4' T8/ELEC LO	2	198	0.122	349	\$160.00	\$59.32	2.7	0	\$0.00	\$0.00	\$30.00	\$0.00	349	\$130.00	\$59.32	2.2	
2	1	Office 2	8	2860	4L4' EE/STD	2	320		4L4' T8/ELEC LO	2	198	0.122	349	\$160.00	\$59.32	2.7	0	\$0.00	\$0.00	\$30.00	\$0.00	349	\$130.00	\$59.32	2.2	
3	1	Gym	8	2860	4L4' EE/STD	6	960		4L4' T8/ELEC LO	6	594	0.366	1047	\$480.00	\$177.95	2.7	0	\$0.00	\$0.00	\$90.00	\$0.00	1047	\$390.00	\$177.95	2.2	
4	1	Lobby	14	5005	4L4' EE/STD	8	1280		4L4' T8/ELEC LO	8	792	0.488	2442	\$640.00	\$415.21	1.5	0	\$0.00	\$0.00	\$120.00	\$0.00	2442	\$520.00	\$415.21	1.3	
5	1	Training Room	8	2860	4L4' EE/STD	12	1920		4L4' T8/ELEC LO	12	1168	0.732	2094	\$960.00	\$355.90	2.7	0	\$0.00	\$0.00	\$180.00	\$0.00	2094	\$780.00	\$355.90	2.2	
6	2	Storage Room	1	357.5	2L22" STD/STD	1	94		2L22"	1	62	0.032	11	\$50.00	\$1.94	25.7	0	\$0.00	\$0.00	\$15.00	\$0.00	11	\$35.00	\$1.94	18.0	
7	3		1	357.5	150W INCANDESCENT	8	1200		44W CF/SI	8	352	0.848	303	\$80.00	\$51.54	1.6	0	\$0.00	\$0.00	\$0.00	\$0.00	303	\$80.00	\$51.54	1.6	
8	4		1	357.5	100W INCANDESCENT	2	200		26W CF/SI	2	56	0.144	51	\$20.00	\$8.75	2.3	0	\$0.00	\$0.00	\$0.00	\$0.00	51	\$20.00	\$8.75	2.3	
9	2	Womens Room	8	2860	2L22" STD/STD	1	94		2L22"	1	62	0.032	92	\$50.00	\$15.56	3.2	0	\$0.00	\$0.00	\$15.00	\$0.00	92	\$35.00	\$15.56	2.2	
10	5		8	2860	60W INCANDESCENT	1	60		15W CF/SI	1	15	0.045	129	\$6.00	\$21.88	0.3	0	\$0.00	\$0.00	\$0.00	\$0.00	129	\$6.00	\$21.88	0.3	
11	6		8	2860	52W INCANDESCENT	1	52		13W CF/SI	1	15	0.037	106	\$6.00	\$17.99	0.3	0	\$0.00	\$0.00	\$0.00	\$0.00	106	\$6.00	\$17.99	0.3	
12	1	Mens Room	10	3575	4L4' EE/STD	1	160		4L4' T8/ELEC LO	1	99	0.061	218	\$80.00	\$37.07	2.2	0	\$0.00	\$0.00	\$15.00	\$0.00	218	\$65.00	\$37.07	1.8	
13	5		10	3575	60W INCANDESCENT	2	120		15W CF/SI	2	30	0.09	322	\$12.00	\$54.70	0.2	0	\$0.00	\$0.00	\$0.00	\$0.00	322	\$12.00	\$54.70	0.2	
14	6		10	3575	52W INCANDESCENT	4	208		13W CF/SI	4	60	0.148	529	\$24.00	\$89.95	0.3	0	\$0.00	\$0.00	\$0.00	\$0.00	529	\$24.00	\$89.95	0.3	
15	1	Utility	0.5	178.75	4L4' EE/STD	2	320		4L4' T8/ELEC LO	2	198	0.122	22	\$160.00	\$3.71	43.2	0	\$0.00	\$0.00	\$30.00	\$0.00	22	\$130.00	\$3.71	35.1	
16	1	Shop Lower	8	2860	4L4' EE/STD	4	640		4L4' T8/ELEC LO	4	396	0.244	698	\$320.00	\$118.63	2.7	0	\$0.00	\$0.00	\$60.00	\$0.00	698	\$260.00	\$118.63	2.2	
17	1	Shop Upper	6	2145	4L4' EE/STD	2	320		4L4' T8/ELEC LO	2	198	0.122	262	\$160.00	\$44.49	3.6	0	\$0.00	\$0.00	\$30.00	\$0.00	262	\$130.00	\$44.49	2.9	
18	1	Locker Room	12	4290	4L4' EE/STD	2	320		4L4' T8/ELEC LO	2	198	0.122	523	\$160.00	\$88.97	1.8	0	\$0.00	\$0.00	\$30.00	\$0.00	523	\$130.00	\$88.97	1.5	
19	7	Attic	0.5	178.75	125W INCANDESCENT	3	375		44W CF/SI	3	132	0.243	43	\$30.00	\$7.38	4.1	0	\$0.00	\$0.00	\$0.00	\$0.00	43	\$30.00	\$7.38	4.1	
20	8	Garage	14	5005	400W MH/BALLAST	21	9345		No Upgrade	21	9345	0	0	\$0.00	\$0.00		0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00		
21	8		14	5005	400W MH/BALLAST	4	1780		No Upgrade	4	1780	0	0	\$0.00	\$0.00		0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00		
22	1	Dispatch	14	5005	4L4' EE/STD	1	160		4L4' T8/ELEC LO	1	99	0.061	305	\$80.00	\$51.90	1.5	0	\$0.00	\$0.00	\$15.00	\$0.00	305	\$65.00	\$51.90	1.3	
23	1		14	5005	4L4' EE/STD	1	160		4L4' T8/ELEC LO	1	99	0.061	305	\$80.00	\$51.90	1.5	0	\$0.00	\$0.00	\$15.00	\$0.00	305	\$65.00	\$51.90	1.3	
24	2	Hallway	14	5005	2L22" STD/STD	17	1598		2L22"	17	1054	0.544	2723	\$850.00	\$462.86	1.8	0	\$0.00	\$0.00	\$255.00	\$0.00	2723	\$595.00	\$462.86	1.3	
25	10	Exterior: Ballards	7	2502.5	32W MH/BALLAST	8	320		No upgrade	8	320	0	0	\$0.00	\$0.00		0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00		
26	11	Exterior: Flag pole Lights	7	2502.5	60W HALOGEN	2	120		No Upgrade	2	120	0	0	\$0.00	\$0.00		0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00		
27	12	Exterior: Sign	7	2502.5	1L8' EE/STD	2	166		1L8' T8/ELEC	2	134	0.032	80	\$160.00	\$13.61	11.8	0	\$0.00	\$0.00	\$30.00	\$0.00	80	\$130.00	\$13.61	9.5	
28	13	Exterior: Pole Lights	7	2502.5	400W HPS/BALLAST	8	3600		No Upgrade	8	3600	0	0	\$0.00	\$0.00		0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00		
29	15	Exterior: Bay	7	2502.5	200W MH/BALLAST	5	1000		No Upgrade	5	1000	0	0	\$0.00	\$0.00		0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00		
30	15	Exterior: Back Bay Doors	7	2502.5	200W MH/BALLAST	2	400		No Upgrade	2	400	0	0	\$0.00	\$0.00		0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00		
31	14	Exterior: Front	7	2502.5	26W CF/SI	7	196		No Upgrade	7	196	0	0	\$0.00	\$0.00		0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00		

**Appendix B: Third Party Energy Suppliers (ESCOs)**

Supplier	Telephone & Web Site
<b>American Powernet Management, LP</b> 437 North Grove St. Berlin, NJ 08009 Attn: Brian Vayda	877-977-2636  <a href="mailto:bvayda@americanpowernet.com">bvayda@americanpowernet.com</a> <a href="http://www.americanpowernet.com">www.americanpowernet.com</a>
<b>Commerce Energy, Inc.</b> 4400 Route 9 South, Suite 100 Freehold, NJ 07728	(800) 556-8457  <a href="http://www.commerceenergy.com">www.commerceenergy.com</a>
<b>ConEdison Solutions</b> Cherry Tree Corporate Center 535 State Highway 38 Cherry Hill, NJ 08002	(888) 665-0955  <a href="http://www.conedsolutions.com">www.conedsolutions.com</a>
<b>Constellation NewEnergy, Inc.</b> 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827  <a href="http://www.newenergy.com">www.newenergy.com</a>
<b>Credit Suisse, (USA) Inc.</b> 700 College Road East Princeton, NJ 08450	212-538-3124  <a href="http://www.creditsuisse.com">www.creditsuisse.com</a>
<b>Direct Energy Services, LLC</b> 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722  <a href="http://www.directenergy.com">www.directenergy.com</a>
<b>FirstEnergy Solutions</b> 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 Supply chain website <a href="http://www.firstenergycorp.com/supplierregistration">www.firstenergycorp.com/supplierregistration</a> <a href="http://www.fes.com">www.fes.com</a>
<b>Glacial Energy of New Jersey, Inc.</b> 207 LaRoche Avenue Harrington Park, NJ 07640	1-877-569-2841  <a href="http://www.glacialenergy.com">www.glacialenergy.com</a>
<b>Hess Corporation</b> 1 Hess Plaza Woodbridge, NJ 070956	(800) 437-7872 Tom Miller <a href="http://www.hess.com">www.hess.com</a>
<b>Integritys Energy Services, Inc.</b> 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	1-877-763-9977 Dole Janssen: 920-617-6029 Charles Kuntz: 614-844-4324 <a href="http://www.integritysenergy.com">www.integritysenergy.com</a>
Supplier	Telephone & Web Site
<b>Liberty Power Delaware, LLC</b> Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866)769-3799 <a href="http://www.libertypowercorp.com">www.libertypowercorp.com</a>
<b>Liberty Power Holdings, LLC</b> Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866) 769-3799  <a href="http://www.libertypowercorp.com">www.libertypowercorp.com</a>

<b>Palmco Power NJ, LLC</b> One Greentree Centre 10000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862  <a href="http://www.PalmcoEnergy.com">www.PalmcoEnergy.com</a>
<b>Pepco Energy Services, Inc.</b> 112 Main Street Lebanon, NJ 08833	(800) ENERGY-9 (363-7499)  <a href="http://www.pepco-services.com">www.pepco-services.com</a>
<b>PPL Energy Plan, LLC</b> 811 Church Road Cherry Hill, NJ 08002	800-281-2000  <a href="http://www.pplenergyplus.com">www.pplenergyplus.com</a>
<b>Sempra Energy Solutions</b> The Mac-Cali Building 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 732-596-6400-Tony Buck <a href="http://www.semprasolutions.com">www.semprasolutions.com</a>
<b>South Jersey Energy Company</b> One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 Gary Bean <a href="mailto:gbean@sjindustries.com">gbean@sjindustries.com</a> <a href="http://www.southjerseyenergy.com">www.southjerseyenergy.com</a>