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August 25, 2010

Local Government Energy Program
Energy Audit Report

For

City of New Brunswick
Engine 5 Fire House

75 Bartlett St
New Brunswick, NJ 08901

Project Number: LGEA63

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INTRODUCTION

On May 19th, Steven Winter Associates, Inc. (SWA) and BSG-PMK performed an energy audit and assessment of the Engine 5 Fire House building in The City of New Brunswick, 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 Engine 5 Fire House Building is a two story building with a basement totaling 3,400 square feet. The lower level of the Engine 5 Fire House building contains; a toilet and the boiler as well as some Verizon equipment. The first or main level, houses the engine bay. The second floor houses the bedrooms, bathrooms and showers, kitchen and dining area/ lounge.

The Engine 5 Fire House Building is occupied consistently by approximately 6 employees at least for 168 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 Engine 5 Fire House Building in The City of New Brunswick, NJ 08901.

Based on the field visit performed by Steven Winter Associates (SWA) and PMK staff on May 7th and May 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, June, 2009 through May, 2010, the Engine 5 Fire House building consumed a total of 19,728 kWh of electricity for a total cost of $3,555. In the most recent full year of natural gas data collected, June, 2009 through May, 2010, 6,072 therms of gas were consumed for a total cost of $6,925. With electricity and natural gas combined, the building consumed 674 MMBtus of energy at a total cost of $10,480.

SWA/BSG-PMK has entered energy information about the Engine 5 Fire House Building in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The building was classified as "Other- Police Station/Fire Station" building not allowing it to receive a performance rating because buildings classified as Other are not eligible. Buildings achieving an Energy Star rating of 75 are eligible to apply for the Energy Star award and receive the Energy Star plaque to convey superior performance. These ratings also greatly help when applying for Leadership in Energy and Environmental Design (LEED) building certification through the United States Green Building Council (USGBC).

The Site Energy Use Intensity is 198 kBtu/ft^{2}yr compared to the national average of a similar building consuming 78 kBtu/ft^{2}yr. Implementing the recommendations included in this report will reduce the building's energy consumption by approximately 60 kBtu/ft^{2}yr. There may be energy procurement opportunities for City of New Brunswick to reduce annual utility costs, which are $596/year higher, when compared to the average estimated NJ commercial utility rates.

Based on the assessment of the Engine 5 Fire House Building, 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:

Replace the air-conditioners servicing the 2nd floor with high-efficiency units on an as-fail basis. Replacing the units would save close to $300 per year, which would not produce a payback acceptable enough to be considered an ECM.

Replace the water heater, which is nearing the end of its useful life, on an as-fail basis.

Replace roof with new roofing materials

Category II: Operations & Maintenance:

Monitor and repair cracked/deteriorated mortar joints

Replace missing drain spouts

Monitor and repair window leaks with caulk or another sealant

Category III: Energy Conservation Measures:

At this time, SWA/BSG-PMK highly recommends a total of **3** Energy Conservation Measures (ECMs) for the Engine 5 Fire House Building that are summarized in the following table. The total investment cost for these ECMs, with incentives, is **$51,169** (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 **$2,704** with an aggregated simple payback of approximately **19 years**. SWA/BSG-PMK estimates that implementing the highly recommended ECMs will reduce the carbon footprint of the facility by **26,518 lbs of CO_2**.

The recommended ECMs and the list below are cost-effective energy efficiency measures and building upgrades that will reduce operating expenses for the City of New Brunswick. Based on the requirements of the LGEA program, the City of New Brunswick must commit to implementing some of these measures, and must submit paperwork to the Local Government Energy Audit program within one year of this report's approval to demonstrate that they have spent, net of other NJCEP incentives, at least 25% of the cost of the audit (per building). The minimum amount to be spent, net of other NJCEP incentives, is $404.50.

SWA recommends that the City of New Brunswick enroll in the following incentive programs through the NJ Office of Clean Energy in order to reduce the installation costs of most measures:

- Direct Install
- SmartStart

The building would not qualify for the Pay-for-Performance program since the energy audit did not show that source energy consumption could not be reduced by 15+%.

Please refer to Appendix C for further details.

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	Electricity rate	$0.18 $/kWh
Energy price escalation rate:	0% per DOE FEMP guidelines	Gas rate	$1.14 $/therm

Avg. Annual Demand: 0.00304 Area of Building (SF): 3,400

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, $	CO2 Reduced, lbs/yr
1	Lighting Upgrades	Empirical Data	$766	$195	$571	2,577	0.65	0	2.59	$0	$464	15	$5,459	1.23	856%	57%	81%	$4,967	3,531
	TOTAL		$766	$195	$571	2,577	0.65	0	2.59	$0.00	$464	-	$5,459	1.23	-	-	-	$4,967	3,531

Table 2 - Recommended Extended-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	Replace Steam Heating System w/ Hot Water & OAR	Contractor	$51,300	$702	$50,598	0	0.00	1,965	57.79	$0	$2,240	25	$38,147	22.59	-25%	-1%	1%	-$11,596	22,988
	TOTAL		$51,300	$702	$50,598	0	0.00	1,965	57.79	$0.00	$2,240	-	$38,147	22.59	-	-	-	-$11,596	22,988

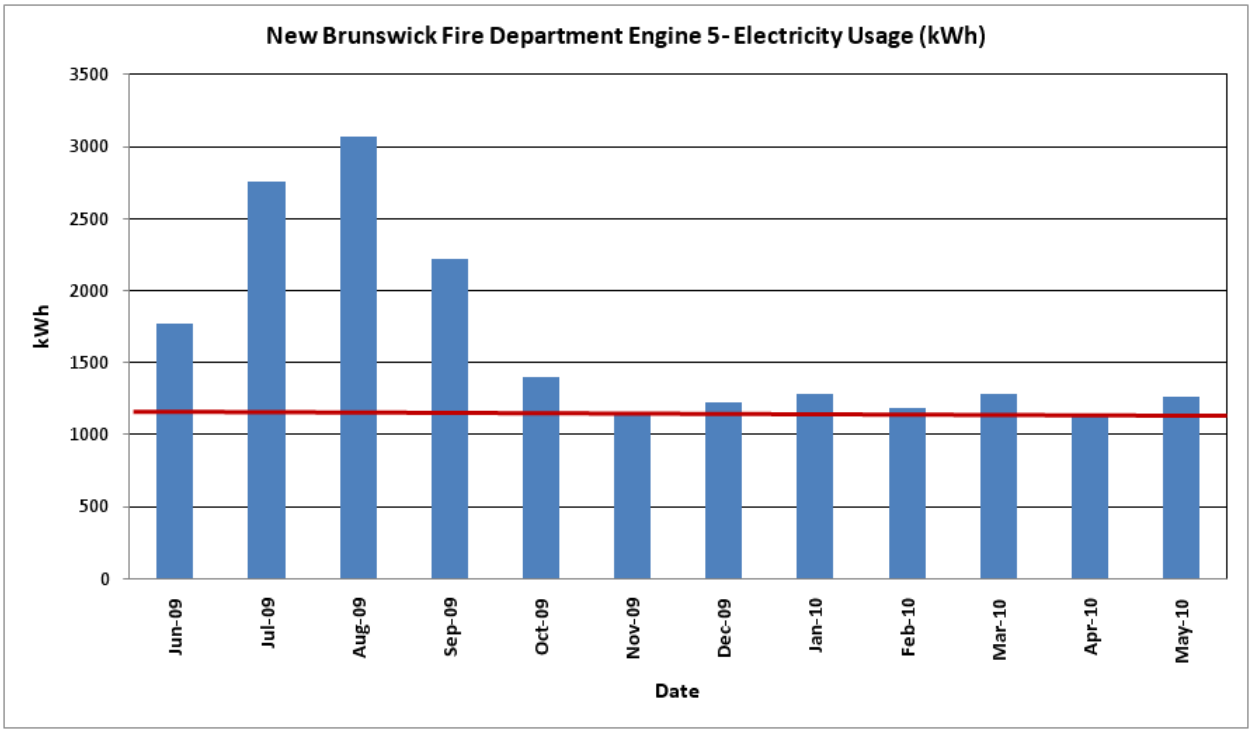
1. HISTORIC ENERGY CONSUMPTION

1.1. Energy Usage and Cost Analysis

SWA/BSG-PMK analyzed utility bills that were received from the utility company supplying the Engine 5 Firehouse building with electric and natural gas from June, 2009 through May, 2010.

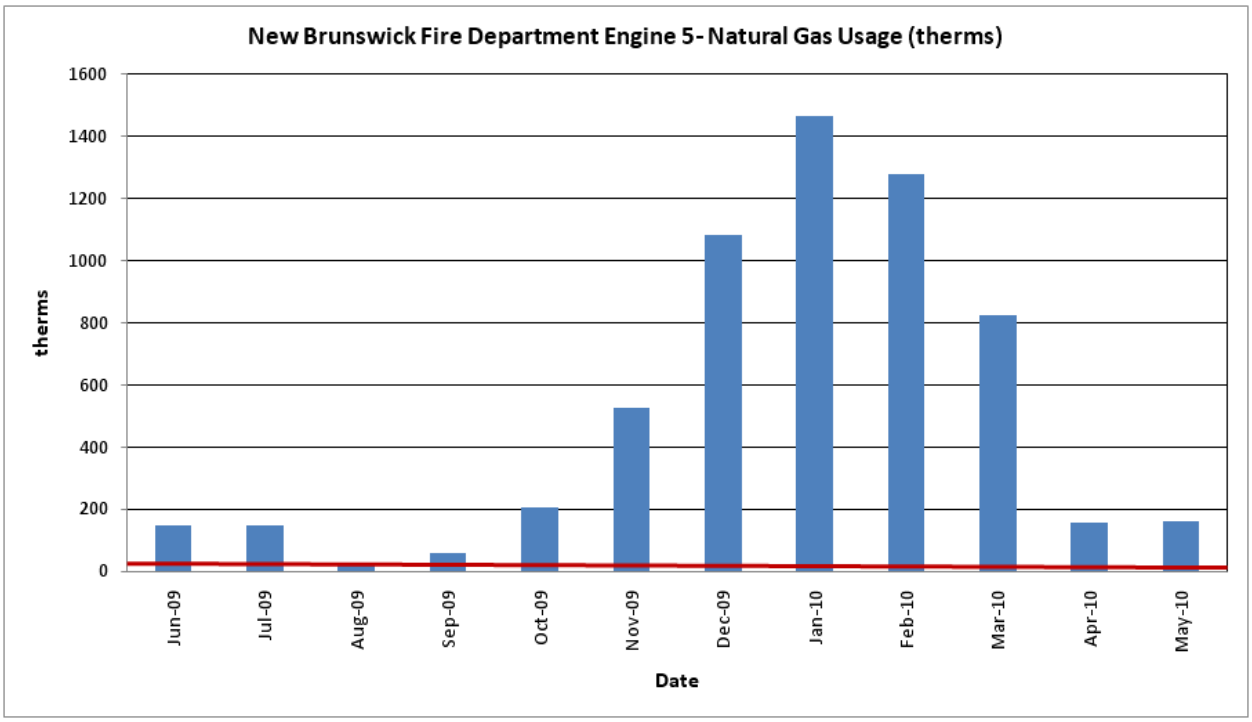
Electricity – The Engine 5 Firehouse is currently served by one electric meter. The facility currently receives electricity from Public Service Electric & Gas at **an average rate of $0.18/kWh** based on 12 months of utility bills from June, 2009 through May, 2010. The facility consumed **approximately 19,728 kWh or $3,555 worth of electricity** in the previous year with an average monthly demand of 5 kW.

The following charts show electricity usage for the Engine 5 Firehouse based on utility bills for the billing analysis period. The red line indicates the estimated base-load in kWh.



Natural Gas – The Engine 5 Firehouse is currently served by one meter for natural gas. The facility currently receives natural gas from Public Service Electric & Gas at **an average aggregated rate of $1.14/therm** based on 12 months of utility bills for June, 2009 through May, 2010. The facility consumed **approximately 6,072 therms or $6,925 worth of natural gas** in the previous year.

The following charts show the natural gas usage for the Engine 5 Firehouse based on utility bills for the analysis period of June, 2009 through May, 2010



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 base-load 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 Engine 5 Firehouse currently receives electricity from Public Service Electric & Gas at a general service market rate for electricity use (kWh) with (kW) demand charge. The facility currently pays an average rate of approximately $0.18/kWh based on the most recent 12 months of utility bills.

The Engine 5 Firehouse currently receives natural gas supply from Public Service Electric & 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 $1.14/therm based on the most recent 12 months of utility bills.

1.3. Energy Benchmarking

SWA/BSG-PMK has entered energy information about the Engine 5 Firehouse in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The username is *cityofnewbrunswick* and the password is *newbrunswick*. The building was classified as a Fire Station preventing it from earning a performance rating which can be used to achieve an Energy Star building certification.

The Site Energy Use Intensity is 198 kBtu/sq.ft/yr compared to the national average of buildings classified as Fire Stations consuming 78 kBtu/sq.ft./yr. Implementing this report's recommended Energy Conservations Measures (ECMs) will reduce use by approximately 60 kBtu/sq.ft./yr.

SWA/BSG-PMK has created the Portfolio Manager site information for New Brunswick City Hall. This information can be accessed at: https://www.energystar.gov/istar/pmpam/, with the following:

Username: *cityofnewbrunswick*
Password: *newbrunswick*

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
New Brunswick FD- Engine 5

Building ID: 2337799
For 12-month Period Ending: April 30, 2010[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: June 02, 2010

Facility	Facility Owner	Primary Contact for this Facility
New Brunswick FD- Engine 5 75 Bartlett St New Brunswick, NJ 08901	City of New Brunswick 76 Bayard St New Brunswick, NJ 08901	Chris Butler 76 Bayard St New Brunswick, NJ 08901

Year Built: 1927
Gross Floor Area (ft²): 3,400

Energy Performance Rating[2] (1-100) N/A

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	67,312
Natural Gas (kBtu)[4]	607,274
Total Energy (kBtu)	674,586
Energy Intensity[5]	
Site (kBtu/ft²/yr)	198
Source (kBtu/ft²/yr)	253
Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	43
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	61%
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.

Certifying Professional
N/A

Meets Industry Standards[6] **for Indoor Environmental Conditions:**	
Ventilation for Acceptable Indoor Air Quality	**N/A**
Acceptable Thermal Environmental Conditions	**N/A**
Adequate Illumination	**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.

EPA Form 5900-16

2. FACILITY AND SYSTEMS DESCRIPTION

This section gives an overview of the current state of the facility and systems. Please refer to the Proposed Further Recommendations section for recommendations for improvement.

Based on visits from SWA on Friday, May 07, 2010, the following data was collected and analyzed.

2.1. Building Characteristics

The two-story, (slab on grade), 3,400 square feet Engine 5 Firehouse building was originally constructed in 1886 with one addition completed in the late 50's. The building houses dormitory style areas, offices and one truck bay. Currently the two towers are rented out to Verizon, who also maintains the roofs of those areas.


Front and Right Side Façade


Front and Left Side Façade


Partial Rear Façade (typ.)

2.2. Building occupancy profiles

Its occupancy is approximately 3-6 employees 24/7.

2.3. Building Envelope

Due to unfavorable weather conditions (min. 18 deg. F delta-T in/outside and no/low wind), no exterior envelope infrared (IR) images were taken during the field audit.

General Note: All findings and recommendations on the exterior envelope (base, walls, roofs, doors and windows) are based on the energy auditors' experience and expertise, on construction document reviews (if available) and on detailed visual analysis, as far as accessibility and weather conditions allowed at the time of the field audit.

2.3.1. Exterior Walls

The exterior wall envelope is mostly constructed of brick veneer over concrete block with 0 inches of detectable insulation. The interior is mostly painted CMU (Concrete Masonry Unit) and finished gypsum wall board.

Note: Wall insulation levels could not be verified in the field or on construction plans, and are based upon similar wall types and time of construction.

Exterior and interior wall surfaces were inspected during the field audit. They were found to be in overall age-appropriate condition with some signs of uncontrolled moisture, air-leakage and other energy-compromising issues detected on all facades.

The following specific exterior wall problem spots and areas were identified:


Cracked/deteriorated mortar joints were detected

2.3.2. Roof

The building's roof is predominantly a flat and parapet type over steel decking, with a built-up asphalt finish and reflective coating. It was replaced 1997. Three inches of foam board roof insulation were recorded.

Note: Roof insulation levels could not be verified in the field, and are based on available construction plans.

Roofs, related flashing, gutters and downspouts were inspected during the field audit. They were reported to be in overall poor condition, with numerous signs of uncontrolled moisture, air-leakage and other energy-compromising issues detected on all roof areas.

The following specific roof problem spots were identified:


Missing downspouts leave signs of water damage on façade.

The roofing material has reached the end of its useful lifespan.

2.3.3. Base

The building's base is composed of a slab-on-grade floor with a perimeter foundation and no detectable slab edge/perimeter insulation.

Slab/perimeter insulation levels could not be verified in the field or on construction plans, and are based upon similar wall types and time of construction.

The building's base and its perimeter were inspected for signs of uncontrolled moisture or water presence and other energy-compromising issues. Overall the base was reported to be in acceptable condition with no signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

2.3.4. Windows

The building contains basically one type of window.

- Double-hung type windows with a non-insulated aluminum frame, clear double glazing and no interior or exterior shading devices. The windows are located throughout the building and were replaced in the 70's.

Windows, shading devices, sills, related flashing and caulking were inspected as far as accessibility allowed for signs of moisture, air-leakage and other energy compromising issues. Overall, the windows were found to be in acceptable condition with only a few signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

The following specific roof problem spot was identified:

Water leakage issues through the windows were reported by employees.

2.3.5. Exterior Doors

The building contains two different types of exterior doors;

- Metal type exterior doors. They are located throughout the building and were replaced fairly recently.

- Overhead type exterior doors. They are located in the front of the building and were replaced in 1994.

All exterior doors, thresholds, related flashing, caulking and weather-stripping were inspected for signs of moisture, air-leakage and other energy-compromising issues. Overall, the doors were found to be in acceptable condition with no signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

2.3.6. Building Air Tightness

Overall the field auditors found the building to be reasonably air-tight with only a few areas of suggested improvements, as described in more detail earlier in this chapter.

The air tightness of buildings helps maximize all other implemented energy measures and investments, and minimizes potentially costly long-term maintenance, repair and replacement expenses.

2.4. HVAC Systems

2.4.1. Heating

Heating is provided by a 401 MBH, 79% efficient Burnham steam boiler, which feeds radiators throughout the building.

Category III Recommendation – ECM #2: Replace the boiler, which is nearing the end of its useful life, with a high-efficiency unit. A hot water heating system is recommended, which is more energy-efficient than the current steam system.

Figure 1: Burnham steam boiler

2.4.2. Cooling

The lounge/kitchen area on the 2nd floor is cooled by a 15,100 BTUH Frigidaire window air-conditioner, installed in 2003. The lounge/bedroom area on the 2nd floor is cooled by a 3-ton Sanyo split-system condensing unit, which feeds a wall-mounted evaporator. Two Trane condensing units, which feed the server area, are owned, operated and paid for solely by Verizon.

Category I Recommendation – Capital Improvements: Replace the air-conditioners servicing the 2nd floor with high-efficiency units on an as-fail basis. Replacing the units would save close to $300 per year, which would not produce a payback acceptable enough to be considered an ECM.

Figure 2: Sanyo split-system condensing unit

2.4.3. Ventilation

Ventilation is provided to the trucks by a Plymouth engine exhaust system, which has a 3 HP Baldor motor. Additional natural ventilation is provided by the doors and windows.

2.4.4. Domestic Hot Water

Domestic hot water is provided by a 40 gallon, 40 MBH Bradford White natural gas water heater, installed in 1999. This unit was found to be in good working condition, however the equipment are nearing the end of their useful life.

Category I Recommendation – Capital Improvements: Replace the water heater, which is nearing the end of its useful life, on an as-fail basis.

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. The facility consists primarily of T12 Fluorescent fixtures with magnetic ballasts.

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

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, and copy machines, etc.

More information can be found in the "Products" section of the Energy Star website at: http://www.energystar.gov. The building is not currently equipped with energy vending miser devices for conserving energy usage by drinks and snacks vending machines. When equipped with the vending miser devices, vending machines use less energy and are comparable in daily energy performance to new ENERGY STAR qualified machines.

In this facility, there are (3) refrigerators, (1) microwave, (1) computer, (2) TVs, and (1) coffee maker.

2.5.3. Elevators

There are no elevators at the facility.

3. Building Systems Equipment List

New Brunswick Fire Department - Engine #5							
Building System	Description	Locations	Model #	Fuel	Space Served	Year Installed	Estimtaed. Remaining Useful Life %
Heating	Steam boiler, 401 MBH, 79% efficient	Basement	Burnham, M# K-5006B, S# 7715507	Natural gas	Radiators, entire building	Approx. 1987	23%
Domestic Hot Water	Water heater, 40 gallons, 40 MBH	Basement	Bradford White, M# MI403S6EN12, S# TG6203676	Natural gas	Entire building	1999	15%
Cooling	Window air-conditioner, 15,100 BTUH	Lounge/ kitchen, 2nd floor	Frigidaire, M# FAS155M1A1	Electricity	Lounge/ kitchen, 2nd floor	2003	30%
Cooling	Split-system condensing unit, 3 tons	Outside	Sanyo, M# C3632A, S# 0137044	Electricity	Lounge/ bedroom	Approx. 2001	40%
	Split-system evaporator	Wall-mounted	Sanyo, M# KS3632, S# 0068352				
Cooling	(2) condensing units - owned, operated and paid for by Verizon	Outside	Trane	Electricity	Server	Approx. 2008	87%
Ventilation	Engine Exhuast System	Garage	Plymoth Baldor 3 hp motor	Electricity	Trucks	Unknown	80%

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:

Replace the air-conditioners servicing the 2nd floor with high-efficiency units on an as-fail basis. Replacing the units would save close to $300 per year, which would not produce a payback acceptable enough to be considered an ECM.

Replace the water heater, which is nearing the end of its useful life, on an as-fail basis.

Replace roof with new roofing materials

Category II: Operations & Maintenance:

Monitor and repair cracked/deteriorated mortar joints

Replace missing drain spouts

Monitor and repair window leaks with caulk or another sealant

Category III Recommendations: Energy Conservation Measures:

Summary Table

ECMs	Descriptions
1	Lighting Upgrades
2	Boiler Replacement

ECM #1: Lighting Upgrade

Description:

Lighting at Engine No. 5 primarily consists of standard-efficiency fixtures with 8' T12 lamps and a magnetic ballast. There are also a number of random Incandescent and Compact Fluorescent Lamps. SWA/BSG-PMK recommends retrofitting the T12 fixtures with T8 lamps and electronic ballasts and replacing the incandescent fixtures with compact fluorescent lamps. Lighting replacements typically yield a short payback and should because of the low cost to upgrade combined favorable energy savings.

Recommended lighting upgrades are detailed in Appendix A.

Installation cost:

	Lighting
Cost	$766.00
Rebate	$195.00
Net Cost	$571.00
Savings (kWh)	2,577
Savings ($)	$463.88
Payback	1.2

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
1	Lighting Upgrades	Empirical Data	$766	$195	$571	2,577	0.65	0	2.59	$0	$464	15	$5,459	1.23	856%	57%	81%	$4,967	3,531

Assumptions:

The electric cost used in this ECM was $0.18/kWh, which was the facilities' average rate for the 12-month period from June, 2009 through May, 2010. 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. The total rebate this ECM qualifies for is $195.

ECM #2: Replace Steam Heating System w/ Hot Water Heating System & Hot Water Outdoor Air Reset Control

Description:

Heating is provided by a Burnham 401 MBH, natural gas, steam boiler, installed in approximately 1987. The unit is near the end of its 30-year useful life, and should be replaced. It is recommended that the existing steam system be replaced with a hot water heating system. Condensing hot water boilers are available, which have efficiencies up to 95%; current steam boilers have efficiencies up to 86%. This conversion would consist of removing the existing boiler and replacing it with a high-efficiency hot water boiler, installing circulation pumps, and installing hot water fan coils and hot water unit heaters. The current unit was 79% efficient at the time of their purchase, but due to their age and condition, their efficiency was estimated to decrease by 10%, to 69%. Hot water outdoor air reset control (OAR) should also be installed. These controllers reduce the maximum boiler water temperature depending on the outside air temperature; for instance, if the outside air temperature is 0°F, the boiler temperature will be 180°F, but if the outside air temperature is 40°F, the boiler temperature will only need to be 130°F.Outdoor air reset generally decreases heating costs by 8-15%.

Installation cost:

Estimated installed cost: $51,300
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_2 Reduced, lbs/yr
2	Replace Steam Heating System w/ Hot Water & OAR	Contractor	$51,300	$702	$50,598	0	0.00	1,965	57.79	$0	$2,240	25	$38,147	22.59	-25%	-1%	1%	-$11,596	22,988

Assumptions:

The cost per therm of natural gas that was used, taken from Fire House #5's energy bills, was $1.14. Also taken from the energy bills was the annual heating consumption for all heating units in the facility, 6,073 therms. The only two units in the building that consume gas are the boiler and the water heater, and therefore, in order to find the boiler's annual gas consumption, the water heater's gas consumption would have to be calculated and subtracted from the total gas consumption. To calculate the amount of gas consumed by the water heater, a spreadsheet created by Rheem was used. The temperature rise of the heated water was set at 77°F on the spreadsheet, and the energy factor (a unit that specifies the

efficiency of water heaters) is specified as 0.62 for gas water heaters. Weight of water was set at 8.33 pounds/gal. Using this data, the therms of natural gas used for heating the water were calculated by the following equation:

$$\text{Therms}_{\text{input}} = \frac{\text{Vol.} \times \text{Wt.}_{\text{Water}} \times \Delta\text{Temp.}}{\text{Energy Factor}} \times \frac{1 \text{ Therm}}{100{,}000.4 \text{ BTU}}$$

The gas consumption by the boiler can now be calculated:

$$\text{Current Gas Input (therms)} = \text{Therms}_{\text{total}} - \text{Therms}_{\text{water heater}}$$

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

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

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

The OAR would provide an additional 8% savings.

Rebates/financial incentives:

This ECM is calculated based on a projected eligibility for New Jersey's SmartStart Rebate, which pays $1.75 per MBH for boilers of this heating capacity. The total incentive for this ECM is $702.

5. ENERGY CONSERVATION MEASURE FUNDING ALTERNATIVES

BSG-PMK/SWA has reviewed several funding options for the purposes of subsidizing the costs for installing the energy conservation measures noted within this report.

Although funding options are constantly changing and updating this project may benefit from enrolling in a number of alternative programs such as the; The NJ SmartStart program with Technical Assistance, alternate funding by applying for financing and competitive grants through the United States Department of Energy as well as local utility incentive programs in an effort to offset a portion of the cost of ECM implementation.

The Smart Start program offers reimbursement incentives for various equipment purchases, and lighting incentives. The benefits and requirements of this program can be found at:
http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings

The Pay-for-Performance program offers incentives for working with an approved contractor to create a scope of work that will reduce source energy consumption by 15+%. Incentives are achieved during various phases of reporting and implementation. The benefits and requirements of this program can be found at:

http://www.njcleanenergy.com/commercial-industrial/programs/pay-performance

Financial assistance is also available through the United States Department of Energy in the form of; Grants, Cooperative Research and development agreements, small business innovation research, and Loan Guarantee Programs. Further information for these programs is available at:
http://www1.eere.energy.gov/financing/types_assistance.html

Local Utility incentives such as a Direct Install Program, offer incentives that can provide up to 80% subsidy of the cost to install particular ECM's. As each utility company has different guidelines and incentives it is important to contact your local utility authority for eligibility in these programs.

Additional funding may also be found through the following funding methods:

- Energy Savings Improvement Program (ESIP) – Public Law 2009, Chapter 4 authorizes government entities to make energy related improvements to their facilities and par for the costs using the value of energy savings that result from the improvements.

- Municipal Bonds – Municipal bonds are a bond issued by a city or other local government, or their agencies. Municipal bonds may be general obligations of the issuer or secured by specified revenues. Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued, although municipal bonds issued for certain purposes may not be tax exempt.

- Power Purchase Agreement – Public Law 2008, Chapter 3 authorizes contractor of up to fifteen (15) years for contracts commonly known as "power purchase agreements."

These are programs where the contracting unit (Owner) procures a contract for, in most cases, a third party to install, maintain, and own a renewable energy system.

BSG-PMK/SWA recommends the Owner review the use of the above-listed funding options in addition to utilizing their standard method of financing for facilities upgrades in order to fund the proposed energy conservation measures.

6. RENEWABLE AND DISTRIBUTED ENERGY MEASURES

6.1. Existing systems

There are currently no existing renewable energy systems.

6.2. Solar Photovoltaic

Photovoltaic (PV) technology was considered for installation on the roofs of the Engine 5 Firehouse. Based on the shading and the amount of roof area available with unobstructed southern exposure it was determined that PV installations are not cost effective or feasible for this location.

6.3. Solar Thermal Collectors

Solar thermal collectors are not recommended for this location based on the shading and amount of roof area available with unobstructed southern exposure.

6.4. 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.

6.5. Geothermal

Geothermal is not applicable to this project. A geothermal system would require the existing heating distribution system to be removed and replaced with a heat pump system. Large underground vertical or horizontal loop systems would need to be installed beneath the existing concrete pad and asphalt. These modifications to the existing heat distribution system would be extremely disruptive to the use of the building and the surrounding neighborhood in addition to the high cost of such an installation and retrofit.

6.6. Wind

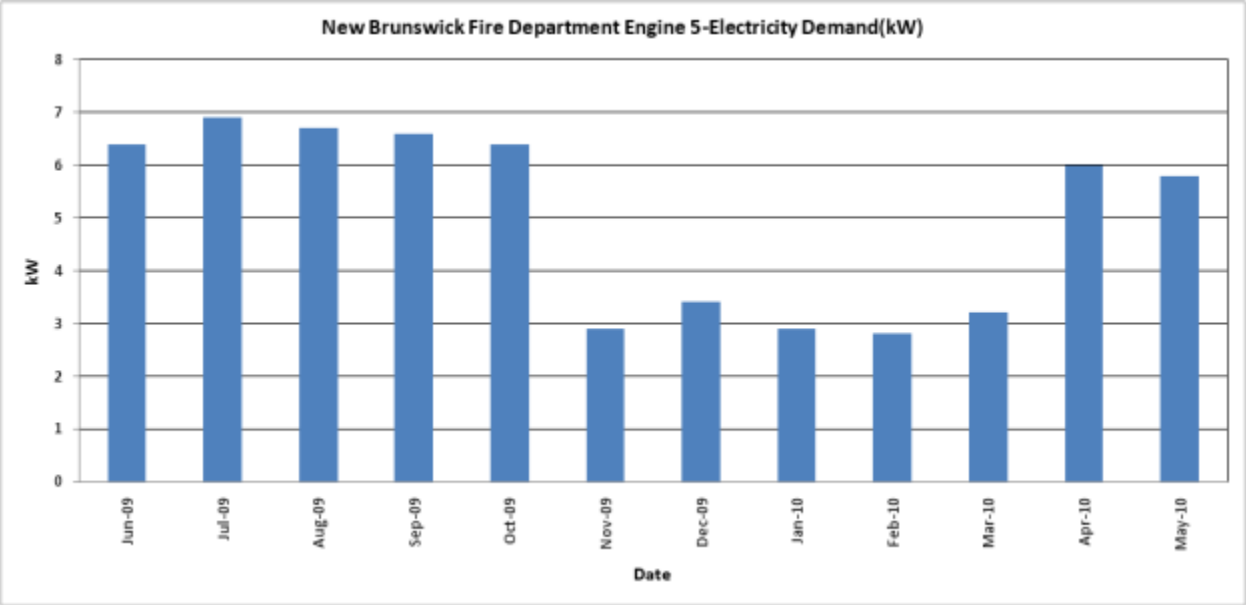
Wind power production is not appropriate for this location because required land is not available for the wind turbine. Also, the available wind energy resource is very low.

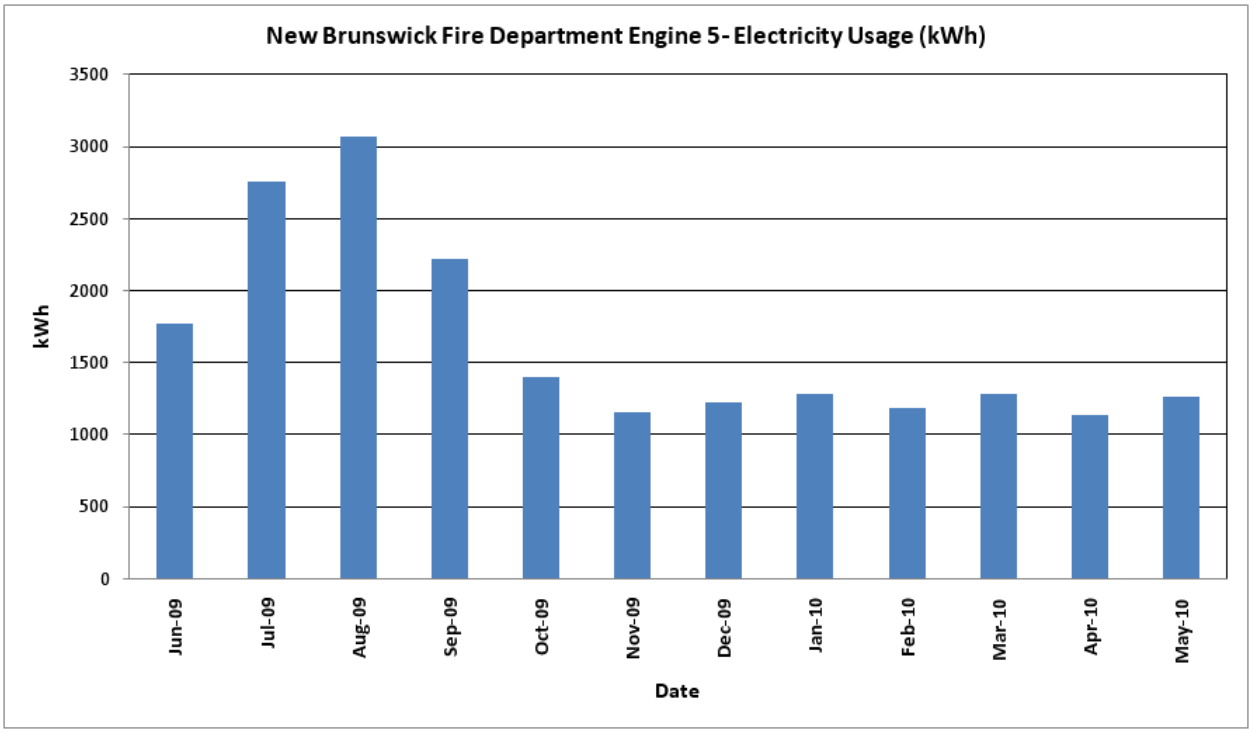
7. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

7.1. Energy Purchasing

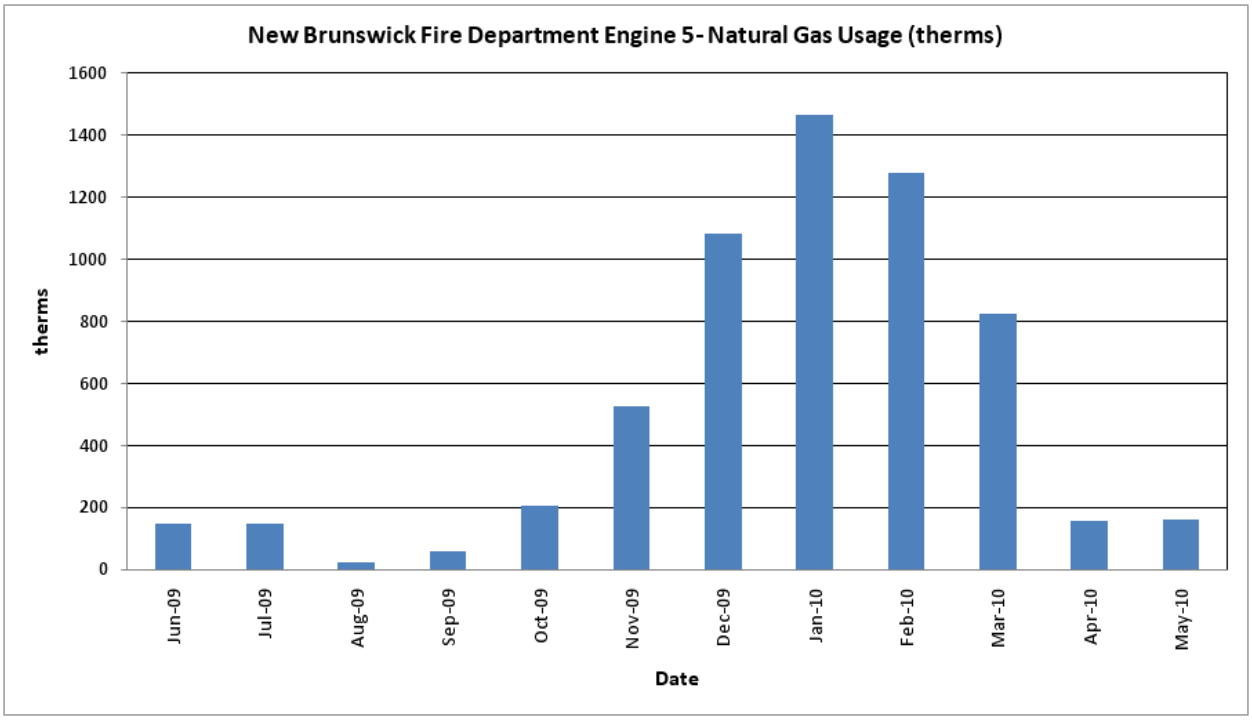
The average electrical peak demand for the previous year was 5 kW and the maximum peak demand was 6.9 kW. The electric and gas load profiles for this project are presented in the following charts.

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) reflect the electrical consumption peaks.



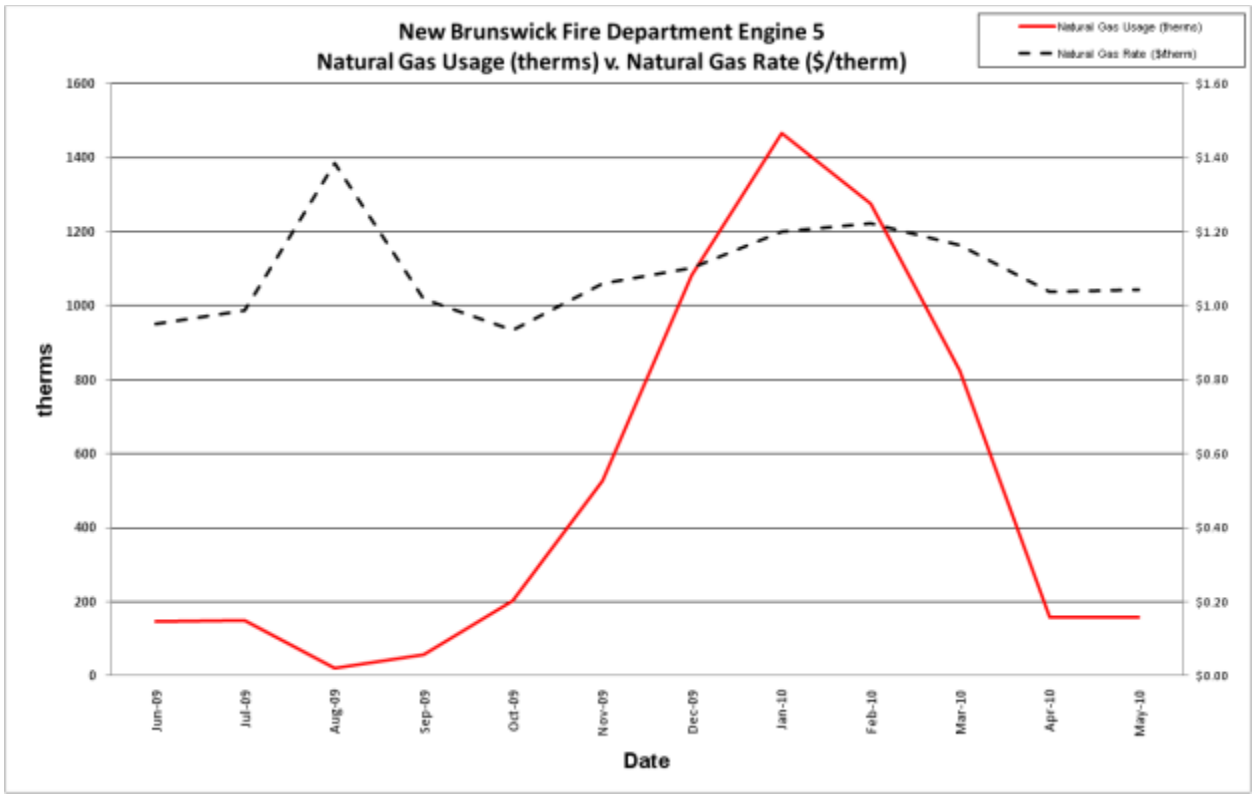
The natural gas usage shows that the most natural gas is consumed in the winter months, meaning the majority of natural gas use in this building is for heating.

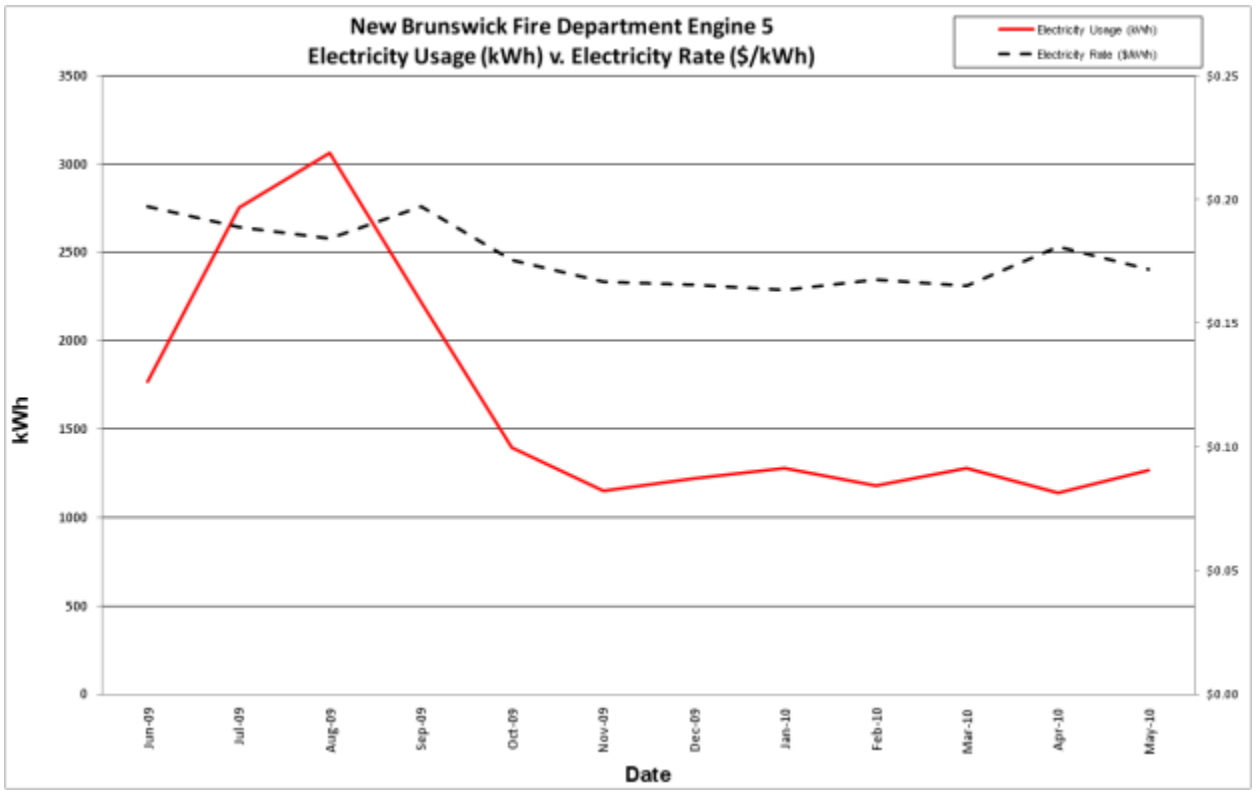
7.2. Tariff analysis

Currently, natural gas is provided via one gas meter with Public Service Electric & Gas serving as transmission and supply provider. The general service rate for natural gas charges a market-rate price based on use and the Engine 5 Firehouse billing data does not breakdown demand costs for all periods. Typically, the natural gas prices increase during the cooling months when natural gas is less of a demand.

The Engine 5 Firehouse is direct-metered (via one meter) and currently purchases electricity from Public Service Electric & Gas at a general service rate. The general service rate for electric charges are market-rate based on use and the Engine 5 Firehouse 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 12 month period.

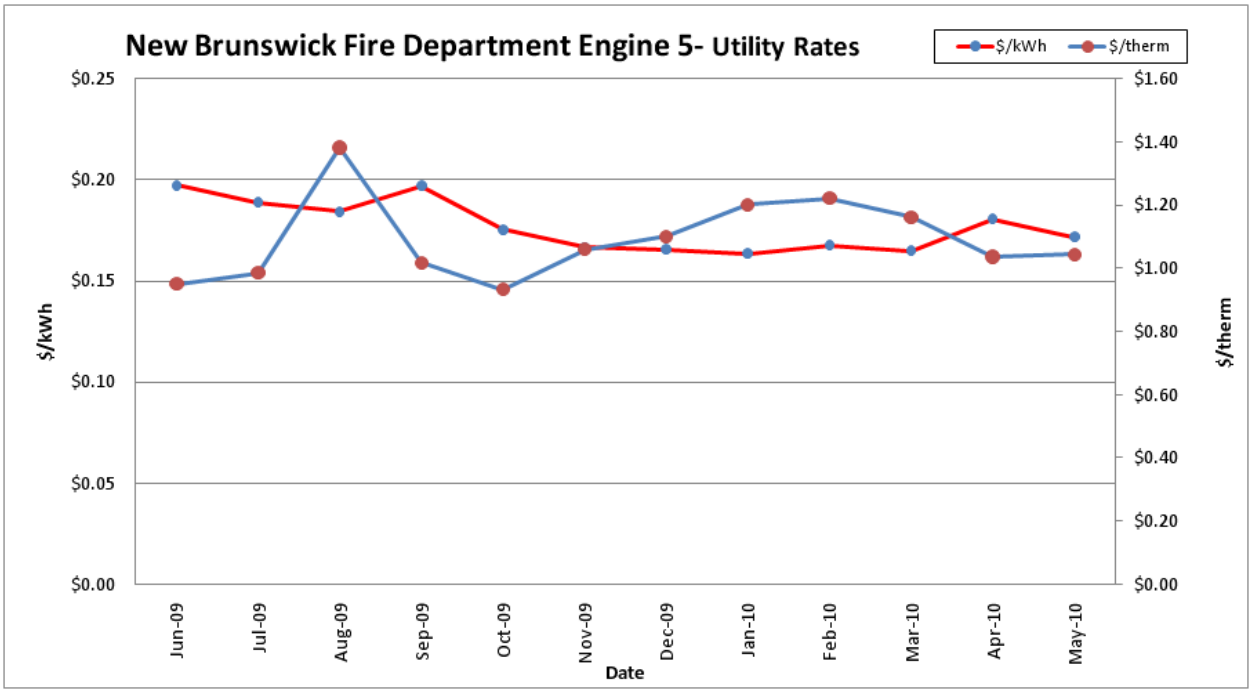

New Brunswick Fire Department Engine 5
Natural Gas Usage (therms) v. Natural Gas Rate ($/therm)
Natural Gas Usage (therms)
Natural Gas Rate ($/therm)
therms
1600
1400
1200
1000
800
600
400
200
0
$1.60
$1.40
$1.20
$1.00
$0.80
$0.60
$0.40
$0.20
$0.00
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Apr-10
May-10
Date


New Brunswick Fire Department Engine 5
Electricity Usage (kWh) v. Electricity Rate ($/kWh)
Electricity Usage (kWh)
Electricity Rate ($/kWh)
kWh
3500
3000
2500
2000
1500
1000
500
0
$0.25
$0.20
$0.15
$0.10
$0.05
$0.00
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Apr-10
May-10
Date

7.3. Energy Procurement strategies

Billing analysis shows large price fluctuations of over the course of the year for the New Brunswick City Hall 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 New Brunswick 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 $ 0.03/kWh, which would have equated to approximately $596 for the past 12 months. New Brunswick already purchases natural gas for lower rate than the average rate of $1.45/therm.



8. METHOD OF ANALYSIS

8.1. 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.

8.2. 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

New Bruswick
Engine No. 5
75 Bartlett Street

BIRDSALL SERVICE
ENGINEERS & CONSULTANT

Upgrade Code	Upgrade Description	Existing Fixture	Existing Watts	Proposed Fixture	Proposed Watts	Lighting: Total # of Upgrades	Lighting: Cost per Upgrade ($)	Lighting: SmartStart Rebate per Upgrade
1	Retrofit the 4' surface mounted fixture by replaceing the (2) T12 Lamps and Magnetic Ballast(s) with (2) T8 Lamps and an Electronic Ballast	2L4' EE/STD	80	2L4' T8/ELEC	61	1	$60.00	$15.00
2	Spiral CFL 18W	18W CF/SI	21	No upgrade	21	1	$0.00	$0.00
3	Retrofit the 8' surface mounted fixture by replaceing the T12 Lamps and Magnetic Ballast(s) with a T8 Lamps and an Electronic Ballast	1L8' EE/STD	83	1L8' T8/ELEC	67	9	$50.00	$15.00
4	Retrofit the 4' surface mounted fixture by replaceing the T12 Lamps and Magnetic Ballast(s) with a T8 Lamps and an Electronic Ballast	1L4' EE/STD	50	1L4' T8/ELEC	31	1	$40.00	$15.00
5	Chandelier- 5 Lamps- CFL 18W	(5) 18W CF/SI	90	No Upgrade	90	1	$0.00	$0.00
6	Replace (3) 60W Incandescent with (3) 15W Compact Fluorescent	(3) 60W INCANDESCENT	180	(3) 13W CF/SI	39	1	$18.00	$0.00
7	Replace (2) 60W Incandescent with (2) 15W Compact Fluorescent	(2) 60W INCANDESCENT	120	(2) 13W CF/SI	26	1	$12.00	$0.00
8	Retrofit the 4' surface mounted fixture by replaceing the (2) T12 Lamps and Magnetic Ballast(s) with (2) T8 Lamps and an Electronic Ballast	2L4' EE/STD	80	2L4' T8/ELEC	61	1	$50.00	$15.00
9	Retrofit the 4' wrap around fixture by replaceing the (4) T12 Lamps and Magnetic Ballast(s) with (4) T8 Lamps and an Electronic Ballast	4L4' EE/STD	160	4L4' T8/ELEC	110	1	$80.00	$15.00
10	Replace 60W Incandescent with a 15W Compact Fluorescent	60W INCANDESCENT	60	15W CF/SI	15	1	$6.00	$0.00
11	Replace 120W Incandescent with 26W Compact Fluorescent	120W INCANDESCENT	120	26W CF/SI	28	5	$10.00	$0.00
12						0	$0.00	$0.00

Summary

	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
Cost	$766.00	$0.00	$766.00
Rebate	$195.00	$0.00	$195.00
Net Cost	$571.00	$0.00	**$571.00**
Savings (kWh)	2,577	0	**2,577**
Savings ($)	$463.88	$0.00	**$463.88**
Payback	1.2		**1.2**

Variables:

$0.18	Avg. Electric Rate ($/kWh)
	Avg. Demand Rate ($/kW)
2080	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 Fixture	Existing Qty.	Existing Watts	Existing Foot Candles	Proposed Fixture	Proposed Qty.	Proposed Watts	kW Reduction	Lighting: Energy Savings, kWh	Lighting: Cost ($)	Lighting: Savings ($)	Lighting: Payback (yrs)	Controls: Type	Controls: Qty.	Occupancy Sensors (ONLY): Energy Savings, kWh	Occupancy Sensors (ONLY): Cost ($)	Occupancy Sensors (ONLY): Savings ($)	Occupancy Sensors (ONLY): Payback (yrs)	SmartStart Rebate: Lighting	SmartStart Rebate: Sensors	Lighting & Occupancy Sensors: Energy Savings, kWh	Lighting & Occupancy Sensors: Post-Rebate Cost ($)	Lighting & Occupancy Sensors: Savings ($)	Lighting & Occupancy Sensors: Payback (yrs)
		Totals:	2188								1197	0.991	2577	$766.00	$463.88	1.7			0	$0.00	$0.00		$195.00	$0.00	2577	$571.00	$463.88	1.2
1	1	Boiler Room	1	260	2L4' EE/STD	1	80		2L4' T8/ELEC	1	61	0.019	5	$60.00	$0.89	67.5			0	$0.00	$0.00		$15.00	$0.00	5	$45.00	$0.89	50.6
2	2		1	260	18W CF/SI	1	21		No upgrade	1	21	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
3	3	Engine Bay	24	6240	1L8' EE/STD	9	747		1L8' T8/ELEC	9	603	0.144	899	$450.00	$161.74	2.8			0	$0.00	$0.00		$135.00	$0.00	899	$315.00	$161.74	1.9
4	4		24	6240	1L4' EE/STD	1	50		1L4' T8/ELEC	1	31	0.019	119	$40.00	$21.34	1.9			0	$0.00	$0.00		$15.00	$0.00	119	$25.00	$21.34	1.2
5	5	Kitchen/Living Room?	12	3120	(5) 18W CF/SI	1	90		No Upgrade	1	90	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
6	6		12	3120	(3) 60W INCANDE	1	180		(3) 13W CF/SI	1	39	0.141	440	$18.00	$79.19	0.2			0	$0.00	$0.00		$0.00	$0.00	440	$18.00	$79.19	0.2
7	7	Bathroom	3	780	(2) 60W INCANDE	1	120		(2) 13W CF/SI	1	26	0.094	73	$12.00	$13.20	0.9			0	$0.00	$0.00		$0.00	$0.00	73	$12.00	$13.20	0.9
8	8	Fridge Room	8	2080	2L4' EE/STD	1	80		2L4' T8/ELEC	1	61	0.019	40	$50.00	$7.11	7.0			0	$0.00	$0.00		$15.00	$0.00	40	$35.00	$7.11	4.9
9	9	Dorm Area	10	2600	4L4' EE/STD	1	160		4L4' T8/ELEC	1	110	0.05	130	$80.00	$23.40	3.4			0	$0.00	$0.00		$15.00	$0.00	130	$65.00	$23.40	2.8
10	10	Bathroom	3	780	60W INCANDESC	1	60		15W CF/SI	1	15	0.045	35	$6.00	$6.32	0.9			0	$0.00	$0.00		$0.00	$0.00	35	$6.00	$6.32	0.9
11	11	Exterior	7	1820	120W INCANDES	5	600		26W CF/SI	5	140	0.46	837	$50.00	$150.70	0.3			0	$0.00	$0.00		$0.00	$0.00	837	$50.00	$150.70	0.3

Appendix B: Third Party Energy Suppliers (ESCOs)

PSE&G SERVICE TERRITORY
Last Updated: 05/19/10

***CUSTOMER CLASS** - R – RESIDENTIAL C – COMMERCIAL I –INDUSTRIAL
****GREEN POWER MARKETER**

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
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, N.J. 08701	(800) 805-8586 www.gesc.com	R/C/I ACTIVE
Green Mountain Energy Company*** 3000 Atrium Way	(800) 810-7300	R/C/I

Mount Laurel, NJ 08054	www.greenmountain.com	**ACTIVE**
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	**C/I** **ACTIVE**
Integrys Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrysenergy.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.south jerseyenergy.com	**C/I** **ACTIVE**

Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com	**C/I** **ACTIVE**
Sterling Planet, Inc.*** 58 Otto Avenue Beverly, NJ 08010	(877) 457-2306 www.sterlingplanet.com	**R/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. 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 50 East Palisades Avenue Englewood, NJ 07631	(800) 388-3862 www.lowcostpower.com	**R/C/I** **ACTIVE**
Viridian Energy 2001 Route 46, Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	**R/C/I** **ACTIVE**

Back to the main supplier page

New Jersey Clean Energy Pay for Performance

The NJ Clean Energy Pay for Performance (P4P) Program relies on a network of Partners who provide technical services to clients. LGEA participating clients who are not receiving Direct Energy Efficiency and Conservation Block Grants are eligible for P4P. SWA is an eligible Partner and can develop an Energy Reduction Plan for each project with a whole-building traditional energy audit, a financial plan for funding the energy measures and an installation construction schedule.

The Energy Reduction Plan must define a comprehensive package of measures capable of reducing a building's energy consumption by 15+%. P4P incentives are awarded upon the satisfactory completion of three program milestones: submittal of an Energy Reduction Plan prepared by an approved Program Partner, installation of the recommended measures and completion of a Post-Construction Benchmarking Report. The incentives for electricity and natural gas savings will be paid based on actual savings, provided that the minimum 15%performance threshold savings has been achieved.

For further information, please see: http://www.njcleanenergy.com/commercial-industrial/programs/pay-performance/existing-buildings .

Direct Install 2010 Program*

Direct Install is a division of the New Jersey Clean Energy Programs' Smart Start Buildings. It is a turn-key program for small to mid-sized facilities to aid in upgrading equipment to more efficient types. It is designed to cut overall energy costs by upgrading lighting, HVAC and other equipment with energy efficient alternatives. The program pays **up to 60%** of the retrofit costs, including equipment cost and installation costs.

Eligibility:

- Existing small and mid-sized commercial and industrial facilities with peak electrical demand **below 200 kW** within 12 months of applying
- Must be located in New Jersey
- Must be served by one of the state's public, regulated or natural gas companies
    - Electric: Atlantic City Electric, Jersey Central Power & Light, Orange Rockland Electric, PSE&G
    - Natural Gas: Elizabethtown Gas, New Jersey Natural Gas, PSE&G, South Jersey Gas

For the most up to date information on contractors in New Jersey who participate in this program, go to: http://www.njcleanenergy.com/commercial-industrial/programs/direct-install

Smart Start

New Jersey's SmartStart Building Program is administered by New Jersey's Office of Clean Energy. The program also offers design support for larger projects and technical assistance for smaller projects. If your project specifications do not fit into anything defined by the program, there are even incentives available for custom projects.

There are a number of improvement options for commercial, industrial, institutional, government, and agricultural projects throughout New Jersey. Alternatives are designed to enhance quality while building in energy efficiency to save money. Project categories included in this program are New Construction and Additions, Renovations, Remodeling and

Equipment Replacement.

For the most up to date information on how to participate in this program, go to: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings.

Renewable Energy Incentive Program*

The *Renewable Energy Incentive Program (REIP)* provides incentives that reduce the upfront cost of installing renewable energy systems, including solar, wind, and sustainable biomass. Incentives vary depending upon technology, system size, and building type. Current incentive levels, participation information, and application forms can be found at the website listed below.

Solar Renewable Energy Credits (SRECs) represent all the clean energy benefits of electricity generated from a solar energy system. SRECs can be sold or traded separately from the power, providing owners a source of revenue to help offset the cost of installation. All solar project owners in New Jersey with electric distribution grid-connected systems are eligible to generate SRECs. Each time a system generates 1,000 kWh of electricity an SREC is earned and placed in the customer's account on the web-based SREC tracking system.

For the most up to date information on how to participate in this program, go to: http://www.njcleanenergy.com/renewable-energy/home/home.

Utility Sponsored Programs

Check with your local utility companies for further opportunities that may be available.

Energy Efficiency and Conservation Block Grant Rebate Program

The Energy Efficiency and Conservation Block Grant (EECBG) Rebate Program provides supplemental funding up to $20,000 for eligible New Jersey local government entities to lower the cost of installing energy conservation measures. Funding for the EECBG Rebate Program is provided through the American Recovery and Reinvestment Act (ARRA).

For the most up to date information on how to participate in this program, go to: http://njcleanenergy.com/EECBG

Other Federal and State Sponsored Programs

Other federal and state sponsored funding opportunities may be available, including BLOCK and R&D grant funding. For more information, please check http://www.dsireusa.org/.

*Subject to availability. Incentive program timelines might not be sufficient to meet the 25% in 12 months spending requirement outlined in the LGEA program.