Steven Winter Associates, Inc.
Architects and Engineers

293 Route 18 South, Suite 330
East Brunswick, NJ 08816
www.swinter.com

Telephone: (866) 676-1972
E-mail: swinter@swinter.com

April 30, 2010

Local Government Energy Program
Energy Audit Final Report

South River Municipal Building
South River, NJ 08882

Project Number: LGEA48

TABLE OF CONTENTS

INTRODUCTION

As an approved energy consulting firm under the Local Government Energy Audit Program (LGEA), Steven Winter Associates, Inc. (SWA) was selected to perform an energy audit and assessment for the Borough of South River municipal buildings. The audit, conducted on January 5th, 11th and 12th, included a review of the:

- Municipal Building
- Public Library
- War Memorial Building
- George Street Firehouse
- Appleby Avenue Firehouse
- Human Services Building
- Criminal Justice Building
- Roads Department Building
- Municipal Building

The buildings are located in South River, NJ. A separate energy audit report is issued for each of the referenced buildings.

This report addresses the South River Municipal Building located at 48 Washington St., South River, NJ 08882. The current conditions and energy-related information were collected in order to analyze and facilitate the implementation of energy conservation measures for the building.

The South River Municipal Building is a single story structure and has had a few renovations since it was built in 1949 of which the last occurred in 2003 when the building infrastructure was upgraded. The building consists of 5,660 square feet of conditioned space. The building houses a public lobby, a conference room, administrative offices, storage areas, mechanical rooms, bathrooms, an executive suite area and general work cubicles. The South River Municipal Building is occupied during the weekdays and generally staffed by 18 (of a total of 20) employees on average with approximately 5-25 visitors per day at the reception area. The building is open Monday-Friday 8:30am-4:30pm. Infrequent evening meetings take place a couple of times a month.

The goal of this Local Government Energy Audit (LGEA) is to provide sufficient information to the Borough of South River to make decisions regarding the implementation of the most appropriate and most cost effective energy conservation measures for the Municipal 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 (BPUs) Office of Clean Energy has assigned TRC Energy Services to administer the Program.

EXECUTIVE SUMMARY

The energy audit performed by Steven Winter Associates (SWA) encompasses the Municipal Building located at 48 Washington St., South River, NJ 08882. The Municipal Building is a single-story building with basement comprising of a total floor area of 5,660 square feet. The original structure was built in 1949 with renovations of which the last occurred in 2003 when the building infrastructure was upgraded.

Based on the field visits performed by the SWA staff on January 5th, 11th and 12th 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, natural gas and electric usage.

From November 2008 through October 2009 the Municipal Building consumed 111,440 kWh or $14,487 worth of electricity at an approximate rate of $0.130/kWh and 1,441 therms or $1,889 worth of natural gas at an approximate rate of $1.311/therm. The joint energy consumption for the building, including both electricity and natural gas, was 524 MMBtu of energy that cost a total of $16,377.

SWA has entered energy information about the Municipal Building in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The building performance rating received is a score of 18 when compared to other buildings of its kind. This low score indicates that there are good opportunities for the Municipal Building to decrease energy use (natural gas or electric usage or a combination thereof) to reach a more desirable Energy Star benchmark rating. SWA encourages the Borough of South River to continue entering utility data in *Energy Star Portfolio Manager* in order to track weather normalized source energy use over time.

The Site Energy Use Intensity is 93.0 kBtu/ft^{2}yr compared to the national average of office buildings consuming 65.0 kBtu/ft^{2}yr. Implementing this report's recommendations will reduce use by approximately 27.9 kBtu/ft^{2}yr, which when implemented would bring the building energy consumption to the national average level.

Based on the assessment of the Municipal Building, SWA has separated the recommendations into three categories (See Section 4 for more details). These are summarized as follows:

Category I Recommendations: Capital Improvement Measures

- Select NEMA Premium motors when replacing motors at the end of their useful operating lives
- Install a Building Management System (BMS)
- Insulate ceiling / underside of roof

Category II Recommendations: Operations and Maintenance

- Maintain roofs - SWA recommends regular maintenance to verify water is draining correctly
- Maintain downspouts and cap flashing - repair / install missing downspouts and cap flashing as needed
- Overgrown ground vegetation should be trimmed / removed
- Provide weather stripping / air sealing

- Repair / seal wall cracks and penetrations
- Provide water efficient fixtures and controls
- Use Energy Start labeled appliances
- Use smart power electric strips
- Create an energy educational program

Category III Recommendations: Energy Conservation Measures - Upgrades with associated energy savings

At this time, SWA highly recommends a total of **2** Energy Conservation Measures (ECMs) for the Municipal Building that is summarized in the following Table 1. The total investment cost for these ECMs without incentives is **$7,515**. SWA estimates a first year savings of **$3,575** with a simple payback of **2.1 years**. SWA also recommends **2** more ECMs with a total first year savings of **$558** that is summarized in Table 2. SWA estimates that implementing these recommended ECMs will reduce the carbon footprint of the Municipal Building by **28,149 lbs of CO_2**, which is equivalent to removing approximately 2 cars from the roads each year or avoiding the need of 69 trees to absorb the annual CO_2 generated.

There are various incentives available in New Jersey to lower the cost of installing the Energy Conservation Measures (ECMs), like NJ SmartStart program and Direct Install through the New Jersey Office of Clean Energy. These incentive programs can help provide technical assistance for the building in the implementation phase of any energy conservation project. The Borough of South River and 6 other nearby boroughs have a long term contract to purchase electricity as a consortium from the South River Electric Utility and do not pay the Societal Benefit Charges (SBCs) that fund NJCEP programs. Therefore, the Borough of South River is not eligible to receive any equipment incentives for energy conservation under the New Jersey Clean Energy Program (NJCEP) at the present time. SWA recommends the Borough of South River initiate a dialogue with the Board of Public Utilities (BPU) to gain access to these and other incentives in the future.

The following two tables summarize the proposed Energy Conservation Measures (ECMs) and their economic relevance. In order to clearly present the overall energy opportunities for the building and ease the decision and choice of which ECM to implement, SWA calculated each ECM independently and did not incorporate slight / potential overlaps between some of the summarized ECMs (i.e. lighting change influence on heating / cooling).

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 cost savings, $	simple payback, yrs	lifetime return on investment, %	annual return on investment, %	internal rate of return, %	net present value, $	CO_2 reduced, lbs/yr
1	retro commissioning	similar projects	7,075	none at this time	7,075	11,144	2.9	144	9.3	1,820	3,458	12	41,492	2.0	486	41	48	26,100	21,542
2.1	install (2) occupancy sensors	RS Means, Lit Search	440	0	440	900	0.2	0	0.5	0	117	12	1,404	3.8	219	18	25	689	1,611
	Totals		**7,515**	**0**	**7,515**	**12,044**	**3.1**	**144**	**9.8**	**1,820**	**3,575**	**12**	**42,896**	**2.1**	**471**	**39**	**47**	**26,789**	**23,153**

Assumptions: Discount Rate: 3.2% per DOE FEMP; Energy Price Escalation Rate: 0% per DOE FEMP Guidelines
Note: A 0.0 electrical demand reduction / month indicates that it is very low / negligible

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 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
2.2	replace (4) T12 outdoors fixture with T8 fixture	RS Means, Lit Search	1,080	0	1,080	613	0.2	0	0.4	35	115	15	1,720	9.4	59	4	6	261	1,098
2.3	replace (7) exterior Metal Halide fixtures with pulse start MH type	RS Means, Lit Search	4,550	0	4,550	2,177	0.6	0	1.3	160	443	15	6,645	10.3	46	3	5	642	3,898
	Totals		**5,630**	**0**	**5,630**	**2,790**	**0.7**	**0**	**1.7**	**195**	**558**	**-**	**8,366**	**10.1**	**49**	**-**	**5**	**904**	**4,995**

1. HISTORIC ENERGY CONSUMPTION

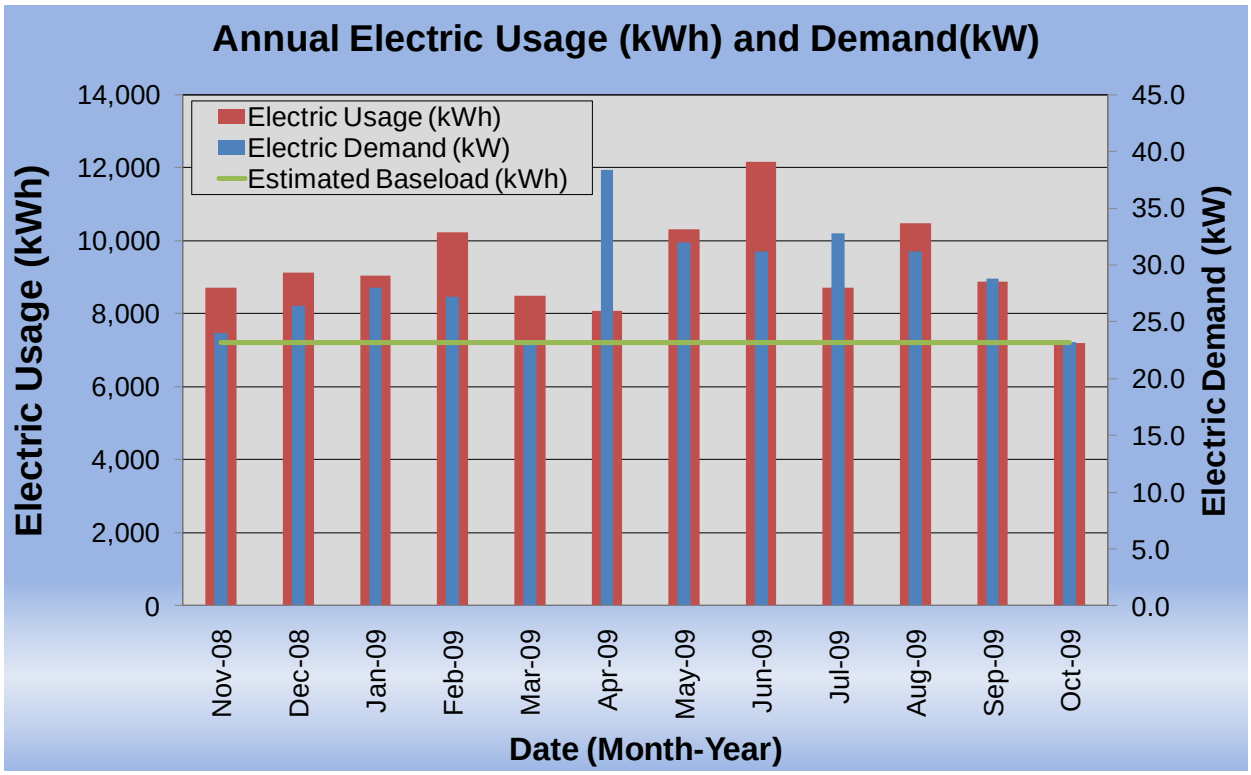
1.1. Energy Usage and Cost Analysis

SWA analyzed utility bills from December 2007 through October 2009 that were received from the utility companies supplying the South River Municipal Building with electric and natural gas.

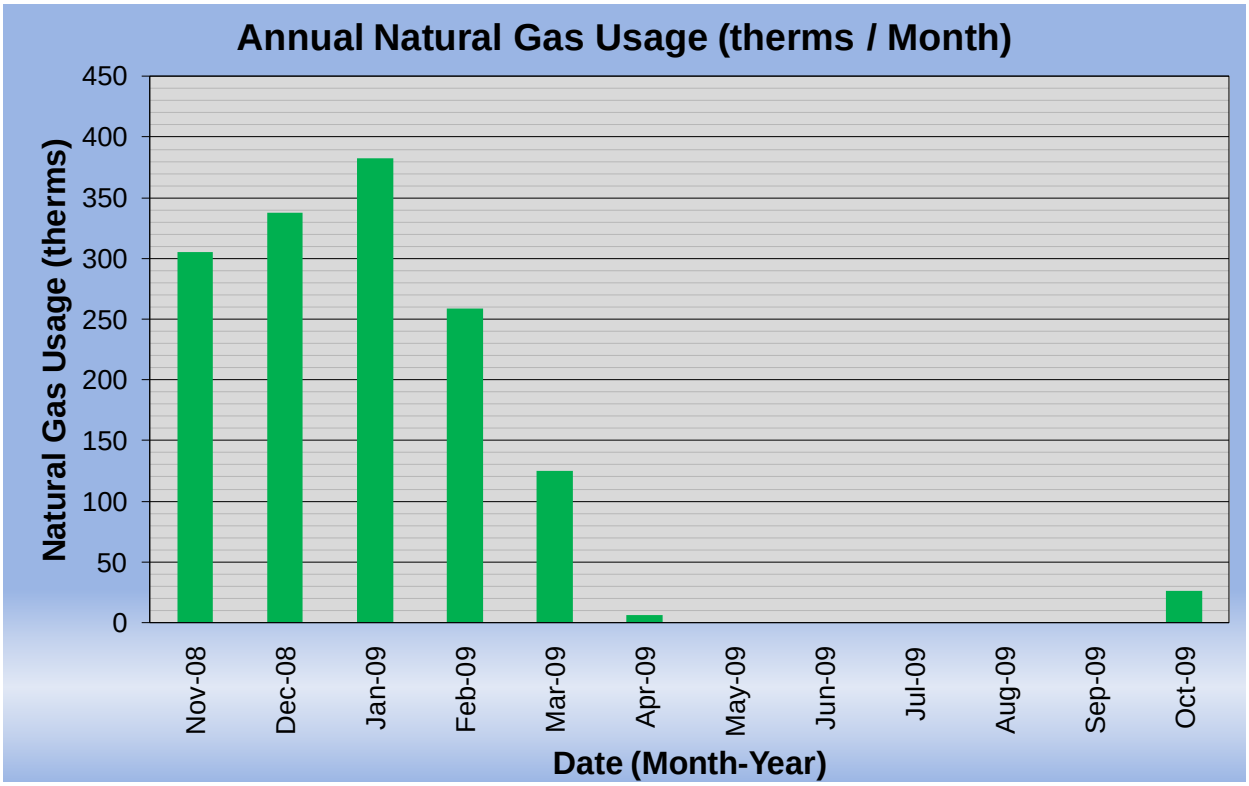
Electricity - The South River Municipal Building is currently served by one electric meter. The Municipal Building currently buys electricity from South River Electric Utility at **an average rate of $0.130/kWh** based on 12 months of utility estimates from November 2008 through October 2009. The Municipal Building purchased **approximately 111,440 kWh or $14,487 worth of electricity** in the previous year. The average monthly demand was 29 kW.

Natural gas - The South River Municipal Building is currently served by one meter for natural gas. The South River Municipal Building currently buys natural gas from PSE&G at **an average aggregated rate of $1.311/therm** based on 12 months of utility bills for November 2008 through October 2009. The South River Municipal Building purchased **approximately 1,441 therms or $1,889 worth of natural gas** in the previous year at a very competitive rate.

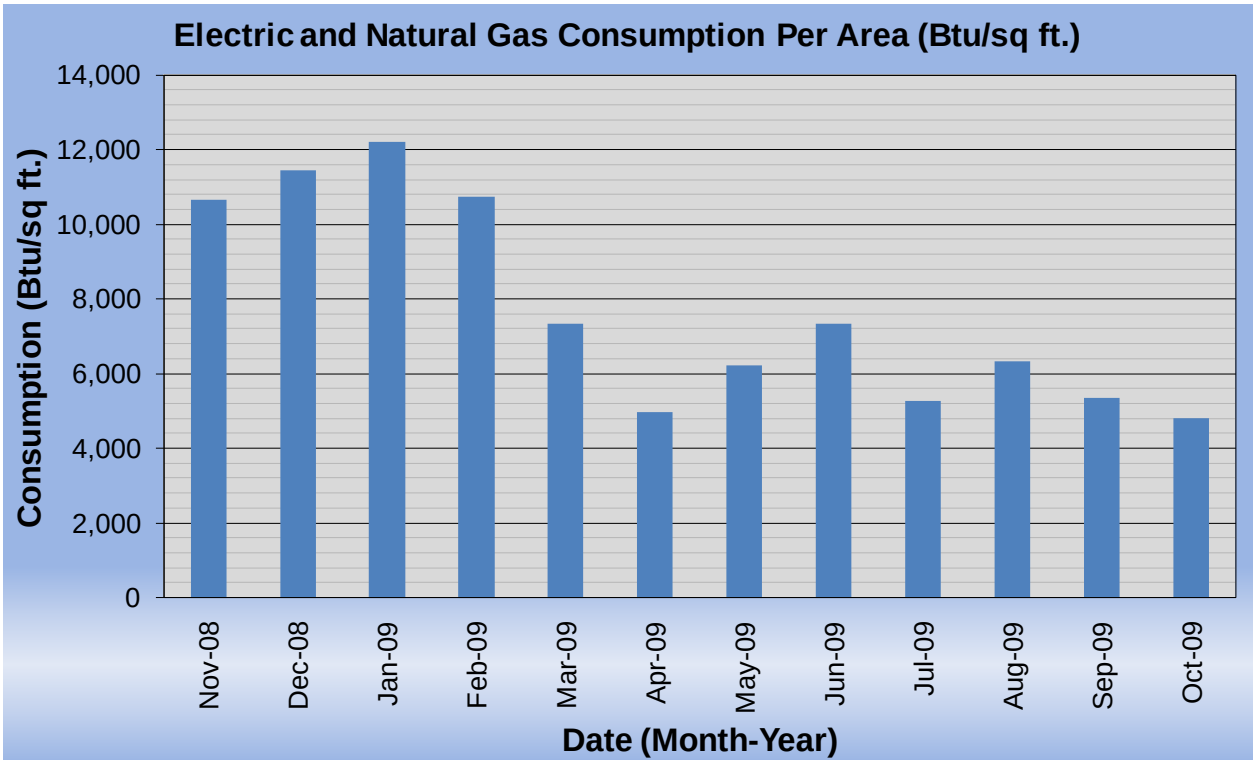
The following chart shows electricity consumption for the Municipal Building based on electric bills for the 12 month period of November 2008 through October 2009. It is assumed that the rooftop package unit blowers are operating at all times to circulate the conditioned air.



The following chart shows the natural gas consumption for the Municipal Building based on natural gas bills for the 12 month period of November 2008 through October 2009.

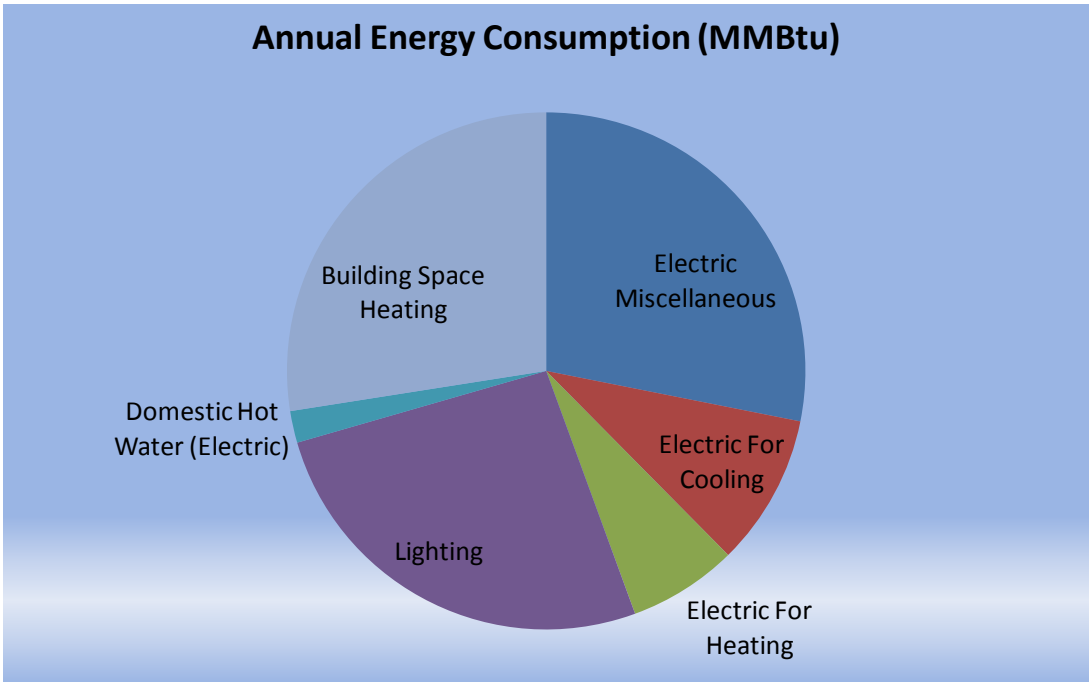


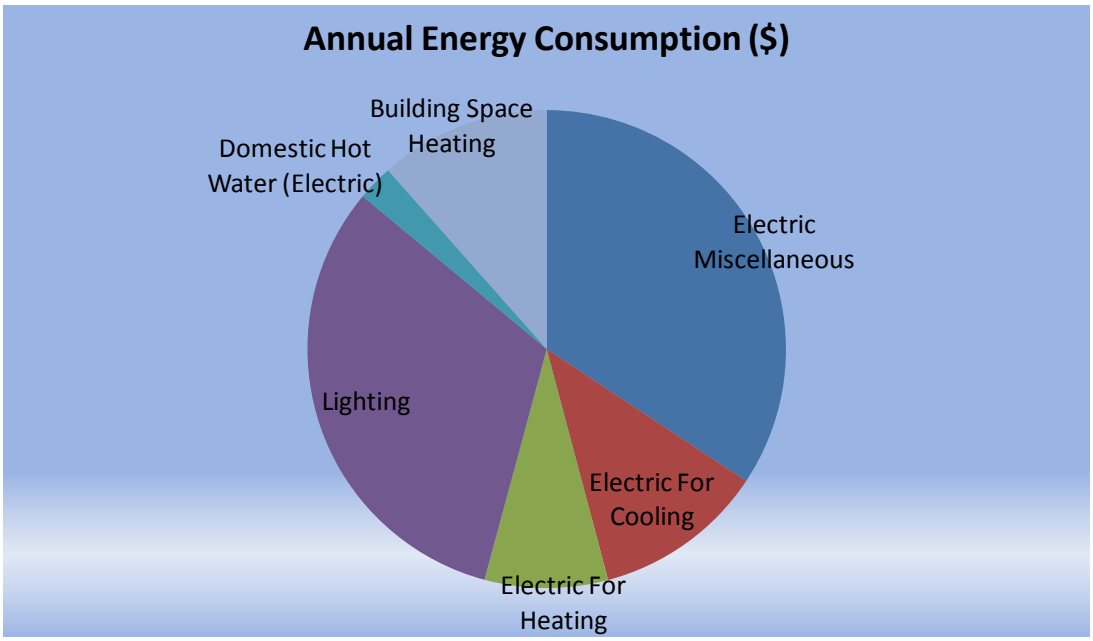
The following chart shows combined natural gas and electric consumption in Btu/sq ft for the Municipal Building based on estimates and utility bills for the 12 month period of November 2008 through October 2009.



The following table and chart pies show energy use for the Municipal Building based on utility bills for the 12 month period of November 2008 through October 2009. Note electrical cost at $38/MMBtu of energy is 3 times as expensive to use as natural gas at $13/MMBtu. The rooftop package units blower electric usage is included in the electric miscellaneous usage below.

2009 Annual Energy Consumption / Costs					
	MMBtu	**% MMBtu**	**$**	**% $**	**$/MMBtu**
Electric Miscellaneous	147	28%	$5,619	34%	38
Electric For Cooling	50	9%	$1,893	12%	38
Electric For Heating	36	7%	$1,362	8%	38
Lighting	137	26%	$5,217	32%	38
Domestic Hot Water (Electric)	10	2%	$397	2%	38
Building Space Heating	144	27%	$1,889	12%	13
Totals	524	100%	$16,377	100%	31
Total Electric Usage	380	73%	$14,487	88%	38
Total Gas Usage	144	27%	$1,889	12%	13
Totals	524	100%	$16,377	100%	31





1.2. Utility Rate

The Municipal Building currently purchases electricity from South River Electric Utility at a general service market rate for electricity use (kWh) with a separate (kW) demand charge. The Municipal Building currently pays an average rate of approximately $0.130/kWh based on the 12 months estimates of November 2008 through October 2009.

The Municipal Building currently purchases natural gas supply from the PSE&G at a competitive general service market rate for natural gas (therms). PSE&G also acts as the transport company. There is one gas meter that provides natural gas service to the Municipal Building currently. The average aggregated rate (supply and transport) for the meter is approximately $1.311/therm based on 12 months of utility bills for November 2008 through October 2009.

Some of the minor unusual utility fluctuations that showed up for a couple of months on the utility bills may be due to adjustments between estimated and actual meter readings.

1.3. Energy Benchmarking

SWA has entered energy information about the Municipal Building in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The building performance rating received is a score of 18 when compared to other Office buildings of its kind. This indicates that there are good opportunities for the Municipal Building to decrease energy use (natural gas or electric usage or a combination thereof) to reach a more desirable Energy Star benchmark rating, even as high as 75. SWA encourages the Borough of South River to continue entering utility data in *Energy Star Portfolio Manager* in order to track weather normalized source energy use over time.

The Site Energy Use Intensity is 93.0 kBtu/sq ft yr compared to the national average of office buildings consuming 65.0 kBtu/sq ft yr. Implementing this report's highly recommended Energy Conservations Measures (ECMs) will reduce use by approximately 9.8 kBtu/sq ft yr, with an additional 1.7 kBtu/sq ft yr from the recommended ECMs, and 16.4 kBtu/sq ft yr from improved

ceiling / roof insulation. These recommendations could account for at least 27.9 kBtu/sq ft yr reduction, which when implemented would bring the building energy consumption to the national average level.

Per the LGEA program requirements, SWA has assisted the Borough of South River to create an *Energy Star Portfolio Manager* account and share the Municipal Building facilities information to allow future data to be added and tracked using the benchmarking tool. SWA has shared this Portfolio Manager site information with the Borough of South River (user name of “sriverboro” with a password of “sriverboro”) and TRC Energy Services (user name of TRC-LGEA).

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Borough of South River - Municipal Building

Building ID: 2018939
For 12-month Period Ending: October 31, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: February 02, 2010

Facility
Borough of South River - Municipal Building
48 Washington Street
South River, NJ 08882

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1949
Gross Floor Area (ft²): 5,660

Energy Performance Rating[2] (1-100) 18

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	379,093
Natural Gas (kBtu)[4]	145,711
Total Energy (kBtu)	524,804

Energy Intensity[5]

Site (kBtu/ft²/yr)	93
Source (kBtu/ft²/yr)	251

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	65

Electric Distribution Utility
Borough of South River

National Average Comparison

National Average Site EUI	65
National Average Source EUI	175
% Difference from National Average Source EUI	44%
Building Type	Office

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.

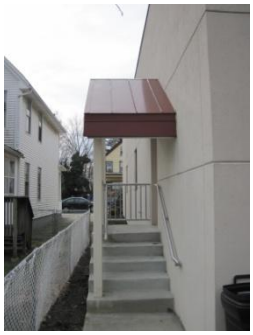
EPA Form 5900-16

2. FACILITY AND SYSTEMS DESCRIPTION

2.1. Building Characteristics

The South River Municipal Building is a single story structure and has had a few renovations since it was built in 1949 of which the last occurred in 2003 when the building infrastructure was upgraded. The building consists of 5,660 square feet of conditioned space. The building houses a vestibule, a public toilet, a public lobby, a conference room, 11 offices, a vault / records storage area, a break / copy / storage room, a telephone / mechanical room, a women's toilet, a men's toilet, a janitor's closet, an executive suite area and general work cubicles. Besides the Municipal / Borough Offices, the following Departments reside in the building: Health, Finance, Construction, Clerk and Fire Prevention.

Front and Side Façade



Partial Rear Façade (typ.)

Partial Left Side Façade (typ.)

Partial Right Side Façade (typ.)

2.2. Building Occupancy Profiles

The South River Municipal Building is occupied during the weekdays and generally staffed by 18 (of a total of 20) employees on average with approximately 5-25 visitors per day at the reception area. The building is open Monday-Friday 8:30am-4:30pm. Infrequent evening meetings take place a couple of times a month.

2.3. Building Envelope

Due to unfavorable weather conditions for the building's exterior envelope finish material (EIFS) (min. 20 deg F delta-T in/ outside & no/ low wind) no exterior envelope infrared (IR) images were taken during the field audit of this building.

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 and thermal 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 EIFS (Exterior Insulation Finishing System) over 5-1/2" light gauge steel framing with 3 inches of fiberglass batt cavity insulation. The interior is mostly painted gypsum wallboard.

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

During the field audit exterior and interior wall surfaces were inspected. They were found / reported to be in overall good / age appropriate condition with only a few signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues located mostly at the front of the building.

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

Damaged EIFS

Damaged EIFS

Overgrown ground vegetation touching / blocking exterior wall surfaces

In light of the exterior wall conditions mentioned above, SWA has the following recommendations, which are further outlined and categorized in the *Executive Summary*:

1. Repair / patch damaged EIFS to prevent water / moisture to penetrate exterior wall cavity.

2. Overgrown ground vegetation should be trimmed / removed to not touch or block exterior wall surfaces from access, ventilation and sunlight.

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 installed recently. There is insufficient detectable / assumed attic / ceiling and XPS (extruded polystyrene, blue or pink) foam board roof insulation. Other parts of the building are also covered by a low-pitch shed type over a steel structure with a standing seam metal finish and some fiberglass batt attic / ceiling and minimal detectable / assumed roof insulation. This roof was installed in 2003.

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

During the field audit roofs, related flashing, gutters and downspouts were inspected. They were found / reported to be in overall acceptable / age appropriate condition with only a few signs of uncontrolled moisture, air-leakage and / or other energy-compromising issues mostly detected on flat roof areas.

The following specific roof problem spots and areas were identified:

Missing / ineffective flashing

Clogged roof drains

Delaminating roof membrane / patches

In light of the roof conditions mentioned above, SWA has the following recommendations, which are further outlined and categorized in the *Executive Summary*:

1. Add insulation to the ineffectively and under-insulated roof / ceiling sections. SWA suggests applying closed-cell spray-foam (R-28 min.) to the underside of the metal decking.

2. Install / repair and maintain roof flashing.

3. Clean and maintain roof drains.

4. Repair / patch leaking / deteriorated asphalt seams.

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 at time of construction.

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

In light of the base conditions mentioned above, SWA has no recommendations at this time.

2.3.4. Windows

The building contains two types of windows.

1. Double-hung type windows with an insulated aluminum frame, UV film coated double glazing and some interior shading devices. The windows are located throughout the building and were replaced in 2003.

2. A single skylight with UV coated glass, located in the front lobby. The skylight was installed recently.

Windows, shading devices, sills, related flashing and caulking were inspected from the exterior and interior as far as accessibility allowed. Based on signs of moisture, air-leakage and other energy compromising issues, overall the windows were found and / or reported to be in good / age appropriate condition with no signs of uncontrolled moisture, but some air-leakage and / or other energy-compromising issues, as reported by building occupants who sometimes feel drafts coming from the direction of some windows..

In light of the window conditions mentioned above, SWA has no recommendations at this time. However, at the next major renovation, attempts should be made to improve the window frame thermal barrier.

2.3.5. Exterior doors

The building contains only one type of exterior door.

1. Aluminum type exterior doors, solid and French door glass type. They are located in the front of the building and the rear and were replaced in 2003.

All exterior doors, thresholds, related flashing, caulking and weather-stripping were inspected. Based on signs of moisture, air-leakage and other energy compromising issues, overall the doors were found / reported to be in good / age appropriate condition with no signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

In light of the door conditions mentioned above, SWA has no recommendations at this time.

2.3.6. Building air-tightness

Overall the field auditors found the building to be reasonably air-tight, considering the building's use and occupancy, as described in more detail in the previous sections.

In addition to all the above mentioned findings SWA recommends air sealing, caulking and / or insulating around all structural members, recessed lighting fixtures, electrical boxes that are part of or penetrate the exterior envelope and where air-leakage can occur.

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

2.4. HVAC Systems

The Municipal Building heating / cooling is provided by two rooftop package units with natural gas furnaces and 15 ceiling mounted Variable Air Volume (VAV) boxes and associated diffusers.

2.4.1. Heating

The heating to the Municipal Building is provided by two rooftop Lennox package units. The side of the building facing Gordon Street is served by AC-2 which has a condenser and a furnace with an estimated AFUE efficiency of 80%. The other side of the building is served by a similar size unit, AC-1 which and has a condenser and a furnace with an estimated AFUE efficiency of 80%. Both units have an estimated 50% useful operating lives left. All the building forced air heat is distributed via 15 VAV boxes and their associated diffusers supported by the drop ceiling. VAV systems are designed to supply only the volume of conditioned air to a space that is needed to satisfy the load. Fan energy is saved when the volume of air handled by the fan is reduced. Air volume control is accomplished by installing modulating dampers, or in some cases, an air valve, in the supply duct to each zone. As the room temperature demand becomes satisfied, the thermostat signals the damper to move the supply air zone valve toward the closed position. When zone valves are throttled, the static pressure in the supply duct changes. A static pressure sensor located in the supply duct senses the static pressure change and either increases or decreases the airflow from the source, using variable speed control or dampers on the main air supply fan. A key component in the VAV system is the air valve. It is commonly installed inside an insulated sheet metal box suspended in a ceiling plenum. The air valve has a damper that regulates the air flow in response to the room's thermostat. A multi-port pressure sensing ring provides both accurate airflow sensing and control in response to duct static pressure. Outside the heat provided by the rooftop units, there isn't any wall perimeter heating. The air handler units are programmed for occupied / unoccupied mode of operation through their respective space thermostats. During the occupied mode of operation, the supply air fan runs continuously. Minimum outdoor air is provided through the outdoor air louver. When the space thermostat is in the heating mode of operation as selected through the heat cool switch, the associated gas fired furnace is cycled to maintain the space temperature. Also, when the switch is indexed to the cool mode, the package condensing unit is cycled to maintain the space temperature. The programmable thermostats are generally located in public areas and because of poor heat balance in the building, when local space heaters are turned on or some windows opened, the room temperature sensors provide a different feedback to the thermostats than would be otherwise. When doors are closed and depending on the higher activity in some areas of the building vs. other lower occupancy spaces, the comfort level for heating / cooling varies significantly to the point where floor plug in heaters and room fans are often used to alleviate the ambient conditions. Also, there isn't any heating / cooling / ventilation schedule controlled by an overall Building Management System (BMS). SWA recommends additional reheat electric elements in the

VAV boxes to assist when local temperatures became too cold. SWA also recommends rebalancing the air distribution in the building (see retro-commissioning ECM#1), as well as investment into a building-wide state of the art BMS.

AC-2 and AC-1, 2 exhaust fans, a programmable thermostat

2.4.2. Cooling

The Municipal Building cooling is provided by Lennox evaporator coils (located in the furnace discharge ductwork). These Lennox fan cooled condensers are located in the AC-1 and AC-2 package units. They use R-22 Freon for air cooling and have 12.3 SEER efficiency. Thermostat control issues are similar to those addressed in the above 2.4.1 Heating section.

A typical arrangement draws fresh air via intake grilles and brings it into a mixing chamber where it is combined with return air and filtered. The air handling unit blower then pushes the filtered, conditioned air to the distribution system. The air is then distributed via VAV boxes and diffusers into the building spaces. The air handlers and outdoor condensers (AC-1 and AC-2), installed in 2003, have an estimated 50% useful operating lives remaining.

2.4.3. Ventilation

The various spaces of the building are ventilated by the Lennox AC-1 and AC-2 units that serve the respective spaces as described in the “Heating / Cooling” sections above. The bathrooms and some closets / storage areas also have exhaust fans (with 1/8 HP motors, 70% estimated efficiency) that purge air to the outside. In general, the building’s 3 Cranes exhaust fans have 50% estimated useful operating lives remaining.

2.4.4. Domestic Hot Water

The domestic hot water (DHW) for the Municipal Building is provided by an A. O. Smith electric heater with 50 gal storage. The heater has an Energy Star rating estimated usage of 5,047 kWh/yr of a maximum 5,109 kWh/yr. The heater has 50% estimated useful operating life left.

High efficiency A. O. Smith electric DHW heater

2.5. Electrical systems

2.5.1. Lighting

Interior Lighting - The interior lighting in the Municipal Building consists of: 2ft-U shaped T8 lamps with electronic ballasts, CFL (Compact Fluorescent Light) and Incandescent lamp fixtures. SWA recommends replacing the inefficient incandescent lamp fixtures with screw-in CFLs. CFL bulbs produce the same lumen output with less wattage than incandescent bulbs and last up to 5 times longer. All replacements should meet local code requirements, such as shielding for safety hazards. Based on measurements of lighting levels for each space, there are not any vastly over-illuminated areas, although SWA would recommend de-lamping a number of fixtures in the main office space. SWA also recommends installing 2 occupancy sensors in areas that are occupied only part of the day and payback on savings are justified, such as in the conference room. Typically, occupancy sensors have an adjustable time delay that shuts down the lights automatically if no motion is detected within a set time period. Advance micro-phonic lighting sensors include sound detection as a mean to control lighting operation. See attached lighting schedule in Appendix A for a complete inventory of lighting throughout the building and estimated power consumption.

Exit Lights - Exit signs were found to be efficient LED type.

Exterior Lighting - The exterior lighting surveyed during the building audit was found to be a mix of Metal Halide and T12 lamp fixtures. Exterior lighting is controlled by photocells and timers. SWA recommends replacing the T12 lamp fixtures with T8 lamp fixtures. SWA also recommends replacing the Metal Halide lamps with pulse start Metal Halide lamps. Pulse-start metal halide (MH) lamps offer the advantages of standard (probe-start) MH lamps, but minimize the disadvantages. They produce higher light output both initially and over time, operate more efficiently, produce whiter light, and turn on and re-strike faster. Due to these characteristics, energy savings can be realized via one-to-one substitution of lower-wattage systems, or by taking advantage of higher light output and reducing the number of fixtures required in the space. SWA is not recommending at this time any upgrades to the exterior photocells or timers.

2.5.2. Appliances and process

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

Computers left on in the building consume a lot of energy. A typical desk top computer uses 65 to 250 watts and uses the same amount of energy when the screen saver is left on. Televisions (DVDs, stereos, computers, and kitchen appliances which now have internal memories or clocks which always require a trickle of power) in meeting areas use approximately 3-5 watts of electricity when turned off. SWA recommends all computers and all appliances (i.e. fridges, coffee makers, televisions, etc) be plugged in to power strips and turned off each evening just as the lights are turned off. The Municipal Building computers are generally NOT programmed for the power save mode, to shut down after a period of time that they have not been used.

2.5.3. Elevators

The Municipal Building is a single-story building without an elevator.

2.5.4. Others electrical systems

Besides a few small transformers in satisfactory condition, there are not currently any other significant energy impacting electrical systems installed at the Municipal Building.

3. EQUIPMENT LIST

Inventory

Building System	Description	Location	Model #	Fuel	Space Served	Year Installed	Estimated Remaining Useful Life %
Heating / Cooling	AC-1 / RTU 1 htg (235 MBH) - 80% est. htg. eff. with cooling (evap / cond - 12.3 SEER) 10 Ton, 3 HP evap blower, 1/3 HP cooling fan	rooftop	Lennox LGA120H2BH2Y, C/N 1710; Serial #: 560 3L01401	Natural Gas / Electric	1/2 of the Municipal Bldg	2003	50%
Heating / Cooling	AC-2 / RTU 2 htg (235 MBH) - 80% est. htg. eff. with cooling (evap / cond - 12.3 SEER) 10 Ton, 3 HP evap blower, 1/3 HP cooling fan	rooftop	Lennox LGA120H2BH2Y, C/N 1710; Serial #: 561 3L01402	Natural Gas / Electric	1/2 of the Municipal Bldg	2003	50%
Ventilators	(3) EF123 - 70% est. eff., 1/8 HP	rooftop	Cranes VEDK08J2A1NA20SPC8; Serial #: 715432001, tags are illegible on others	Electric	bathrooms, mech rm / janitor's closet	2003	50%
Domestic Hot Water	one 50 gal DHW unit electrically heated with a 4,500 Watt upper and 4,500 Watt lower elements Energy Star rating est usage of 5,047 kWh/yr of a max of 5,109 kWh/yr	back mech room	A.O. Smith ELJF 50 100; Serial #: AL030009011	Electric	Municipal Bldg	2003	50%
Lighting	See details - Appendix A	See details - Appendix A	See details - Appendix A	Electric	Municipal Bldg	2003	50%

Note: The remaining useful life of a system (in %) is an estimate based on the system date of built and existing conditions derived from visual inspection

4. ENERGY CONSERVATION MEASURES

Based on the assessment of the South River Municipal Building, SWA has separated the investment opportunities into three recommended categories:

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

- Install premium motors when replacements are required - Select NEMA Premium motors when replacing motors that have reached the end of their useful operating lives, such as those in Ac-1 and AC-2.

- Install a Building Management System (BMS) - Currently, the building is controlled by individual stand alone programmable thermostats. An overall digital BMS will result in energy savings via improved temperature control and coordination for the building. This recommendation will ensure that the retro-commissioning estimated savings (per ECM#1) are maintained and reproducible. SWA recommends this upgrade with the next major building renovation.
- Insulate ceiling / underside of roof - SWA recommends removing loose batt fiberglass insulation at ceiling / roof level and replacing it with 4" thick closed cell (polyurethane) sprayed on foam insulation. Sprayed foam insulation is applied as a liquid which contains a polymer (such as polyurethane or modified urethane) and a foaming agent. The liquid is sprayed through a nozzle onto the underside of the plywood roof sheathing and any cavities where it expands to fill every nook and cranny. Because it expands into tight areas, sprayed foam is ideal for insulating framing and around outlets. By acting as a wind and air barrier, it often eliminates the need for separate air-tightness detailing which can increase energy efficiency and allow downsizing of the heating and cooling system equipment. Sprayed foam insulation does not shrink, sag, settle, or biodegrade. A DOE e-Quest model was performed to estimate energy savings with the new proposed insulation. The assumptions made in the e-Quest model were that the existing insulation U-Value is 0.475 Btu/hr sq ft °F vs. the new spray foam insulated U-Value of 0.034 Btu/hr sq ft °F. The estimated 5,660 sq ft under roof insulation cost is approximately $39,620, based on RS Means 2009 (Building Construction Cost Data) and similar projects, which would provide $2,678 annual energy savings and a 14.8 year simple payback, which could reduce the building's energy requirements by at least 16.4 kBtu/sq ft yr. SWA recommends that this work be included with the next major building renovation.

  Alternatively, involving much less building disturbance, the roof could be replaced (although it is relatively new - 7 years old) with a sprayed on foam roofing system having integral insulation. Sprayed Polyurethane Foam (SPF) is a combination of isocyanate and polyol. These two components are fed through a proportioner, which heats then pumps the two separate components to the spray gun, where they are mixed and sprayed onto the substrate. Because it is sprayed onto the roof as a liquid, it forms a single continuous structure that is seamless and very stable. SPF requires a clean surface for proper application. It must be dry, free of contaminants like oil, and properly fastened to the substrate. A protective elastomeric top coat is required which is typically sprayed on as well. Foam roofing has many advantages over traditional roofing methods, such as: there are no seams or joints, the foam can be sprayed onto virtually any surface, it is lightweight, has the best insulating properties available for commercial construction and foamed roofs require a minimal upkeep. The estimated cost to apply SPF to

5,660 sq ft of roof surface is approximately $56,600, based on RS Means 2009 (Building Construction Cost Data) and similar projects.

Category II Recommendations: Operations and Maintenance

- Maintain roofs - SWA recommends regular maintenance to verify water is draining correctly. Repair / patch leaking / deteriorated asphalt seams.

- Maintain downspouts and cap flashing - Repair / install missing downspouts and cap flashing as needed to prevent water / moisture infiltration and insulation damage.

- Overgrown ground vegetation should be trimmed / removed to not touch or block exterior wall surfaces from access, ventilation and sunlight.

- Provide weather stripping / air sealing - Doors and vestibules should be observed annually for deficient weather-stripping and replaced as needed. The perimeter of all window frames should also be regularly inspected and any missing or deteriorated caulking should be re-caulked to provide an unbroken seal around the window frames. Any other accessible gaps or penetrations in the thermal envelope penetrations should also be sealed with caulk or spray foam.

- Repair / seal wall cracks and penetrations - SWA recommends as part of the maintenance program to install proper flashing, seal wall cracks and penetrations wherever necessary in order to keep insulation dry and effective. Repair / patch damaged EIFS to prevent water / moisture to penetrate exterior wall cavity.

- Provide water efficient fixtures and controls - Adding controlled on / off timers on all lavatory faucets is a cost-effective way to reduce domestic hot water demand and save water. Building staff can also easily install faucet aerators and / or low-flow fixtures to reduce water consumption. There are many retrofit options, which can be installed now or incorporated as equipment is replaced. Routine maintenance practices that identify and quickly address water leaks are a low-cost way to save water and energy. Retrofitting with more efficient water-consumption fixtures / appliances will save both energy and money through reduced energy consumption for water heating, while also decreasing water / sewer bills.

- Use Energy Star labeled appliances - such as Energy Star refrigerators that should replace older energy inefficient equipment.

- Use smart power electric strips - in conjunction with occupancy sensors to power down computer equipment when left unattended for extended periods of time.

- Create an energy educational program - that teaches how to minimize their energy use. The US Department of Energy offers free information for hosting energy efficiency educational programs and plans, for more information please visit: http://www1.eere.energy.gov/education/ .

Category III Recommendations: Energy Conservation Measures - Summary Table

ECM#	Description of Highly Recommended 0-5 Year Payback ECMs
1	retro-commission mechanical equipment
2.1	install occupancy sensors
	Description of Recommended 5-10 Year Payback ECMs
2.2 & 2.3	replace Metal Halide with pulse start Metal Halide and T12 with T8 fixtures
	Description of Renewable ECMs
3	install a 5 kW solar PV rooftop system

ECM#1: *Retro-Commissioning*

Description:

Retro-commissioning is a process that seeks to improve how building equipment and systems function together. Depending on the age of the building, retro-commissioning can often resolve problems that occurred during design or construction and / or address problems that have developed throughout the building's life. Owners often undertake retro-commissioning to optimize building systems, reduce operating costs, and address comfort complaints from building occupants.

Since the systems at the Municipal Building have undergone some renovations in recent years, and the building continues to have concerns with thermal comfort control, SWA recommends undertaking retro-commissioning to optimize system operation as a follow-up to completion of the upgrades. The retro-commissioning process should include a review of existing operational parameters for both newer and older installed equipment. During retro-commissioning, the individual loop temperatures and (setback) schedules should also be reviewed to identify opportunities for optimizing system performance, besides air balancing and VAV boxes' proper operation.

Installation cost:

Estimated installed cost: $7,075 (includes $6,014 of labor)
Source of cost estimate: Similar projects

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 cost savings, $	simple payback, yrs	lifetime return on investment, %	annual return on investment, %	internal rate of return, %	net present value, $	CO_2 reduced, lbs/yr
1	retro commission-ing	similar projects	7,075	none at this time	7,075	11,144	2.9	144	9.3	1,820	3,458	12	41,492	2.0	486	41	48	26,100	21,542

Assumptions: Since the utility bills have some accounting fluctuations, it is difficult to determine the amount of energy used for heating and cooling the Municipal Building. Based on experience with similar buildings, SWA estimated the heating and cooling energy consumption. Typical savings for retro-commissioning range from 5-20%, as a percentage of the total space conditioning consumption. SWA assumed 10% savings. Estimated costs for retro-commissioning range from $0.50-$2.00 per square foot. SWA assumed $1.25 per square foot of a total

square footage of 5,660. SWA also assumed on the average 1 hr/wk operational savings when systems are operating per design vs. the need to make more frequent adjustments.

Rebates / financial incentives:

There aren't any current incentives for this measure at this time.

Options for funding ECM:

This project may benefit from applying for a grant from the State of New Jersey - American Recovery and Reinvestment Act Energy Efficiency and Conservation Block Grant (EECBG) Program to offset a portion of the cost of implementation.

http://www.state.nj.us/recovery/infrastructure/eecbg_program_criteria.html

ECM#2: *Building Lighting Upgrades*

Description:

On the days of the site visits, SWA completed a lighting inventory of the Municipal Building (see Appendix A). The interior lighting in the Municipal Building consists of: 2ft-U shaped T8 lamps with electronic ballasts, CFL (Compact Fluorescent Light) and Incandescent lamp fixtures. SWA recommends replacing the inefficient incandescent lamp fixtures with screw-in CFLs. CFL bulbs produce the same lumen output with less wattage than incandescent bulbs and last up to 5 times longer. All replacements should meet local code requirements, such as shielding for safety hazards. SWA would recommend de-lamping a number of fixtures in the main office space. SWA also recommends installing 2 occupancy sensors in areas that are occupied only part of the day and payback on savings are justified, such as in the conference room. Typically, occupancy sensors have an adjustable time delay that shuts down the lights automatically if no motion is detected within a set time period. Advance micro-phonic lighting sensors include sound detection as a mean to control lighting operation. *Exit Lights* - Exit signs were found to be efficient LED type. The exterior lighting surveyed during the building audit was found to be a mix of Metal Halide and T12 lamp fixtures. SWA recommends replacing the T12 lamp fixtures with T8 lamp fixtures. SWA also recommends replacing the Metal Halide lamps with pulse start Metal Halide lamps. Pulse-start metal halide (MH) lamps offer the advantages of standard (probe-start) MH lamps, but minimize the disadvantages. They produce higher light output both initially and over time, operate more efficiently, produce whiter light, and turn on and re-strike faster. Due to these characteristics, energy savings can be realized via one-to-one substitution of lower-wattage systems, or by taking advantage of higher light output and reducing the number of fixtures required in the space. See attached lighting schedule in Appendix A for a complete inventory of lighting throughout the building and estimated power consumption. The labor in all these installations was evaluated using prevailing electrical contractor wages. The Borough of South River may decide to perform this work with in-house resources from its Maintenance Department on a scheduled, longer timeline than otherwise performed by a contractor.

Installation cost:

Estimated installed cost: $6,070 (includes $3,978 of labor)
Source of cost estimate: RS *Means; Published and established costs*

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 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
2.1	install (2) occupancy sensors	RS Means, Lit Search	440	0	440	900	0.2	0	0.5	0	117	12	1,404	3.8	219	18	25	689	1,611
2.2	replace (4) T12 outdoors fixture with T8 fixture	RS Means, Lit Search	1,080	0	1,080	613	0.2	0	0.4	35	115	15	1,720	9.4	59	4	6	261	1,098
2.3	replace (7) exterior Metal Halide fixtures with pulse start MH type	RS Means, Lit Search	4,550	0	4,550	2,177	0.6	0	1.3	160	443	15	6,645	10.3	46	3	5	642	3,898
	Totals		**6,070**	**0**	**6,070**	**3,690**	**1.0**	**0**	**2.2**	**195**	**675**	**-**	**9,770**	**9.0**	**61**	**-**	**7**	**1,592**	**6,607**

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. SWA also assumed an aggregated 3 hr/yr to replace aging burnt out lamps vs. newly installed.

Rebates / Financial Incentives:

NJ Clean Energy - There aren't any incentives at this time offered by the state of NJ for this energy conservation measure.

Options for Funding ECM:

This project may benefit from applying for a grant from the State of New Jersey - American Recovery and Reinvestment Act Energy Efficiency and Conservation Block Grant (EECBG) Program to offset a portion of the cost of implementation.

http://www.state.nj.us/recovery/infrastructure/eecbg_program_criteria.html

ECM#3: *Install a 5 kW PV System*

Description:

Currently the South River Municipal Building does not use any renewable energy systems. Renewable energy systems such as photovoltaic panels, can be mounted on the building roofs, and can offset a portion of the purchased electricity for the building. Power stations generally have two separate electrical charges: usage and demand. Usage is the amount of electricity in kilowatt-hours that a building uses from month to month. Demand is the amount of electrical power that a building uses at any given instance in a month period. During the summer periods, when electric demand at a power station is high due to the amount of air conditioners, lights, equipment, etc… being used within the region, demand charges go up to offset the utility's cost to provide enough electricity at that given time. Photovoltaic systems not only offset the amount of electricity use by a building, but also reduce the building's electrical demand, resulting in a higher cost savings as well. The Borough of South River may want to review installing a 5 kW PV system to offset electrical demand and reduce the annual net electric consumption for the Municipal Building. The Municipal Building is not eligible for a 30% federal tax credit. The Municipal Building may want to consider applying for a grant and / or engage a PV generator / leaser who would install the PV system and then sell the power at a reduced rate. Typically, a major utility provides the ability to buy SREC's at $600/MWh or best market offer. However, this option is not available from the local utility. See below for more information.

Considering the available square footage of the Municipal Building roof at this time, it would be possible to install a 50 kW PV system. However, considering the facts that:

- the solar PV system should be limited in size to below the minimum electrical demand since the utility will not buy back excess power generated by the system
- the solar PV system installation cost should be limited to allow for available grant money to considerably shorten the payback period

SWA has considered the system size stated above. Should the Municipal Building decide to expand the building and increase the air conditioned spaces, the minimum demand would increase over the historical data cited in this analysis, and therefore further study into expanding the proposed system would be recommended.

There are many possible locations for a 5 kW PV installation on the building roofs. A commercial crystalline 230 watt panel has 17.5 square feet of surface area (13.1 watts per square foot). A 5 kW system needs approximately 22 panels which would take up 380 square feet. The installation of a renewable Solar Photovoltaic power generating system could serve as a good educational tool and exhibit for the community.

Installation cost:

Estimated installed cost: $37,500 (includes $15,000 of labor)
Source of cost estimate: Similar Projects

Economics (<u>without</u> NJ EECBG Grant):

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 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
3	Install a 5 kW Solar Photovoltaic system	Similar Projects	37,500	0	37,500	5,902	5.0	0	3.6	0	767	25	19,182	48.9	0	0	-5	-23,675	10,568

Assumptions: SWA estimated the cost and savings of the system based on past PV projects. SWA projected physical dimensions based on a typical Polycrystalline Solar Panel (230 Watts, model #ND-U230C1). PV systems are sized based on Watts and physical dimensions for an array will differ with the efficiency of a given solar panel (W/sq ft).

Rebates/financial incentives:

NJ Clean Energy rebates are not available since the South River Utility is part of an energy consortium that does not pay the Societal Benefits Charge that funds these rebates.

NJ Clean Energy - Solar Renewable Energy Certificate Program. Each time a solar electric system generates 1000kWh (1MWh) of electricity, a SREC is issued which can then be sold or traded separately from the power. The buildings must also become net-metered in order to earn SRECs as well as sell power back to the electric grid. An estimated SREC value of $3,000 could be realized with a traditional solar PV system setup. However, since net metering is not available from the local utility, savings in the form of SRECs were NOT incorporated into the above analysis.

Options for funding ECM:

This project may benefit from applying for a grant from the State of New Jersey Energy Efficiency and Conservation Block Grant (EECBG) Program to offset a portion of the cost of implementation.
http://www.state.nj.us/recovery/infrastructure/eecbg_program_criteria.html

5. RENEWABLE AND DISTRIBUTED ENERGY MEASURES

5.1. Existing systems

There aren't currently any existing renewable energy systems.

5.2. Wind

Description:

A Wind system is not applicable for this building because the area does not have winds of sufficient velocity to justify installing a wind turbine system.

5.3. Solar Photovoltaic

Description:

A Solar PV System would not be cost effective because of insufficient financial incentives and a simple payback greater than 40 years. See ECM#3.

5.4. Solar Thermal Collectors

Description:

Solar thermal collectors are not cost effective for this building and would not be recommended due to the insufficient and not constant use of domestic hot water throughout the building to justify the expenditure.

5.5. Combined Heat and Power

Description:

CHP is not applicable for this building because of several existing rooftop cooling systems and insufficient domestic hot water use.

5.6. Geothermal

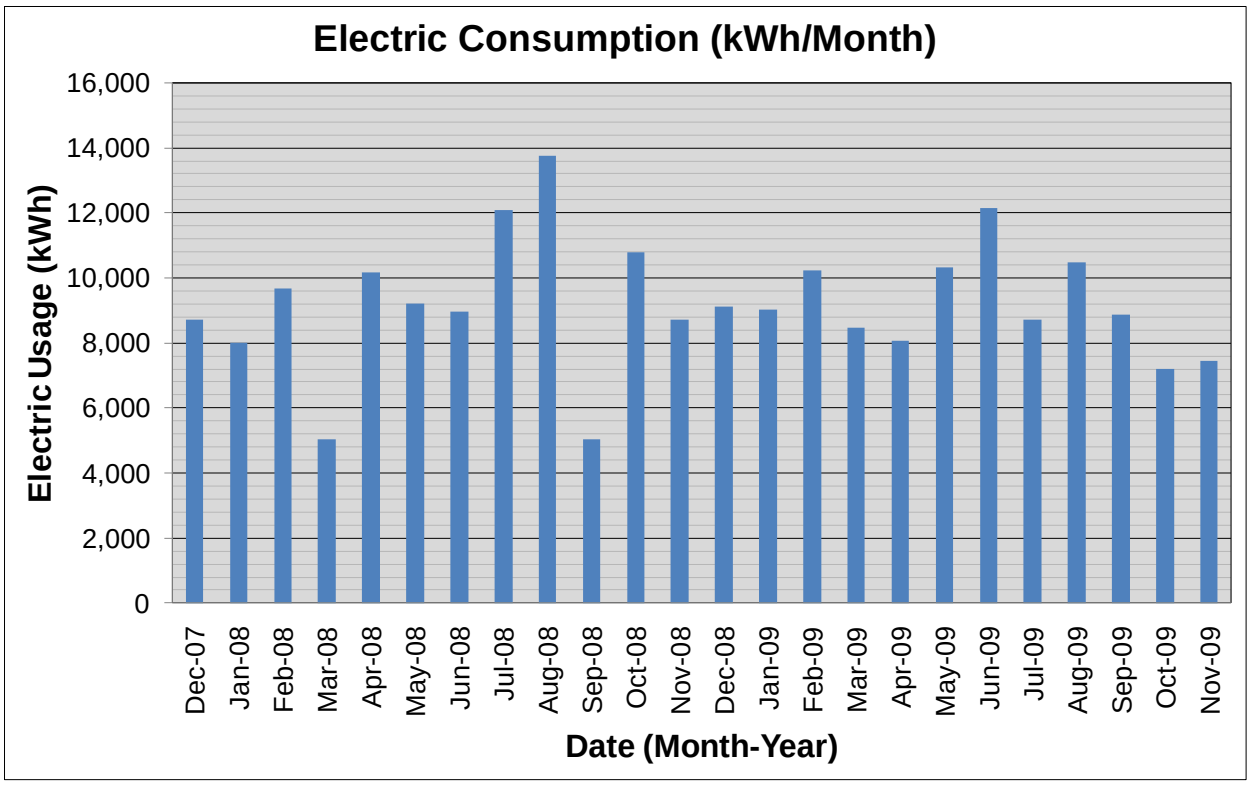
Description:

Geothermal would not be cost effective because since it would require replacement of the existing HVAC system, of which major components still have as a whole a number of useful operating years.

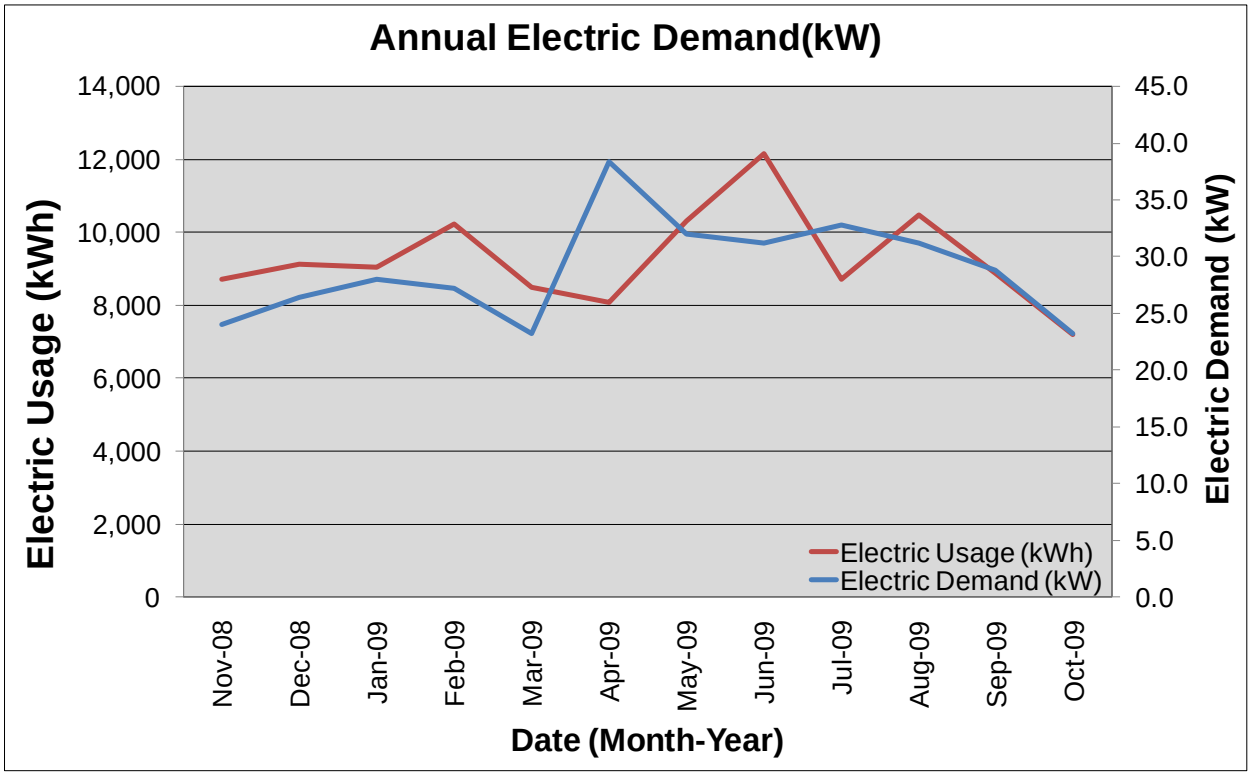
6. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

6.1. Load Profiles

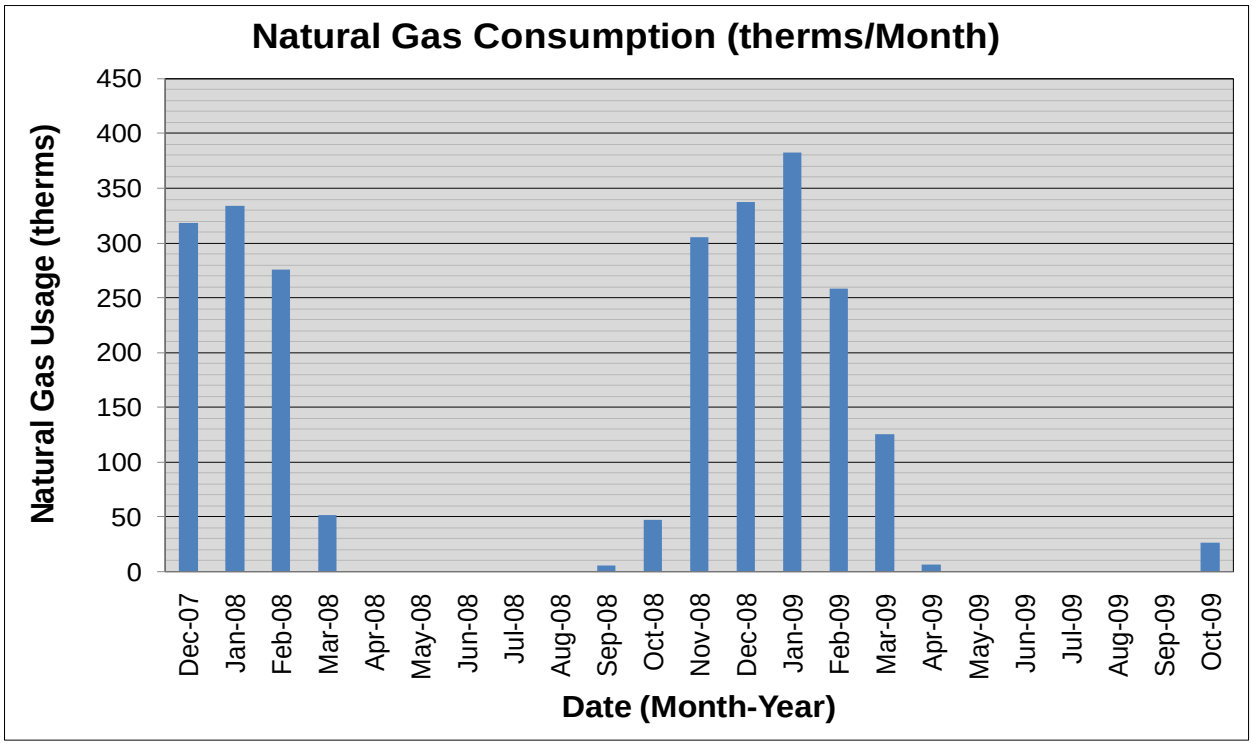
The following are charts that show the annual electric and natural gas load profiles for the South River Municipal Building. For annual electric and natural gas usage please also see Section 1. Historic Energy Consumption.

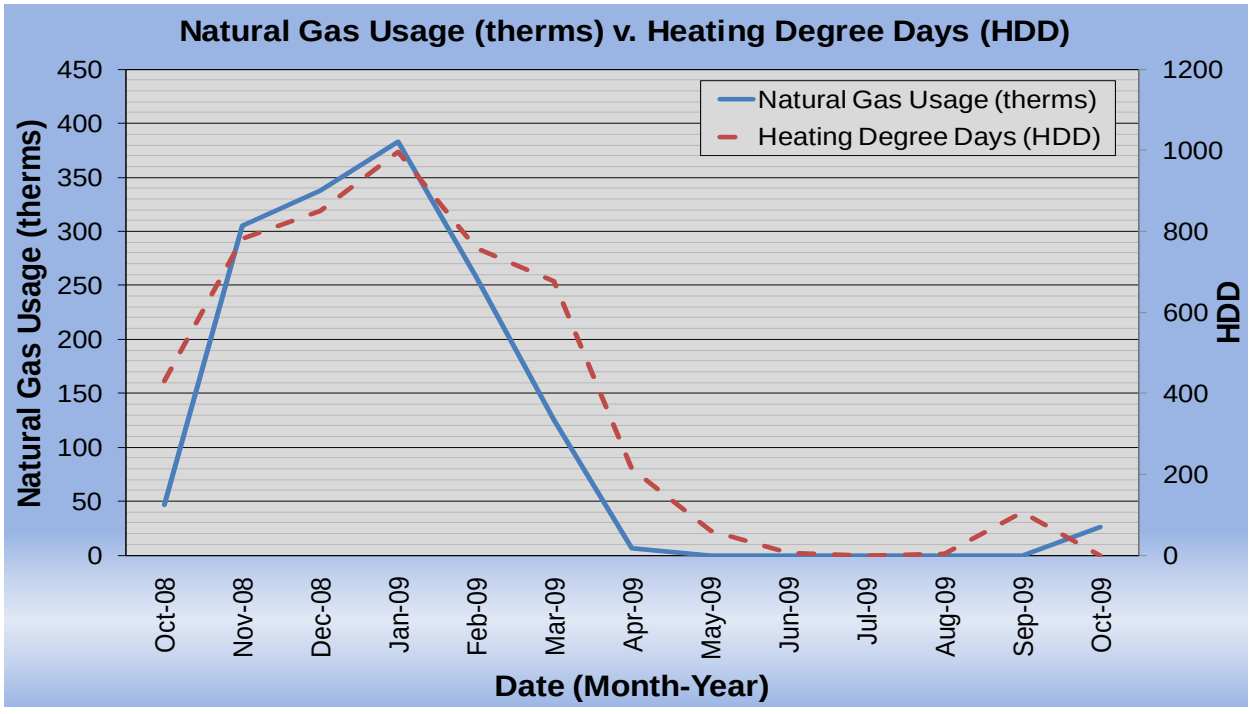


Some minor unusual electric fluctuations shown may be due to adjustments between estimated and actual meter readings. Also, note on the following chart how the electrical Demand peaks (except for a few unusual fluctuation anomalies) follow the electrical consumption peaks.



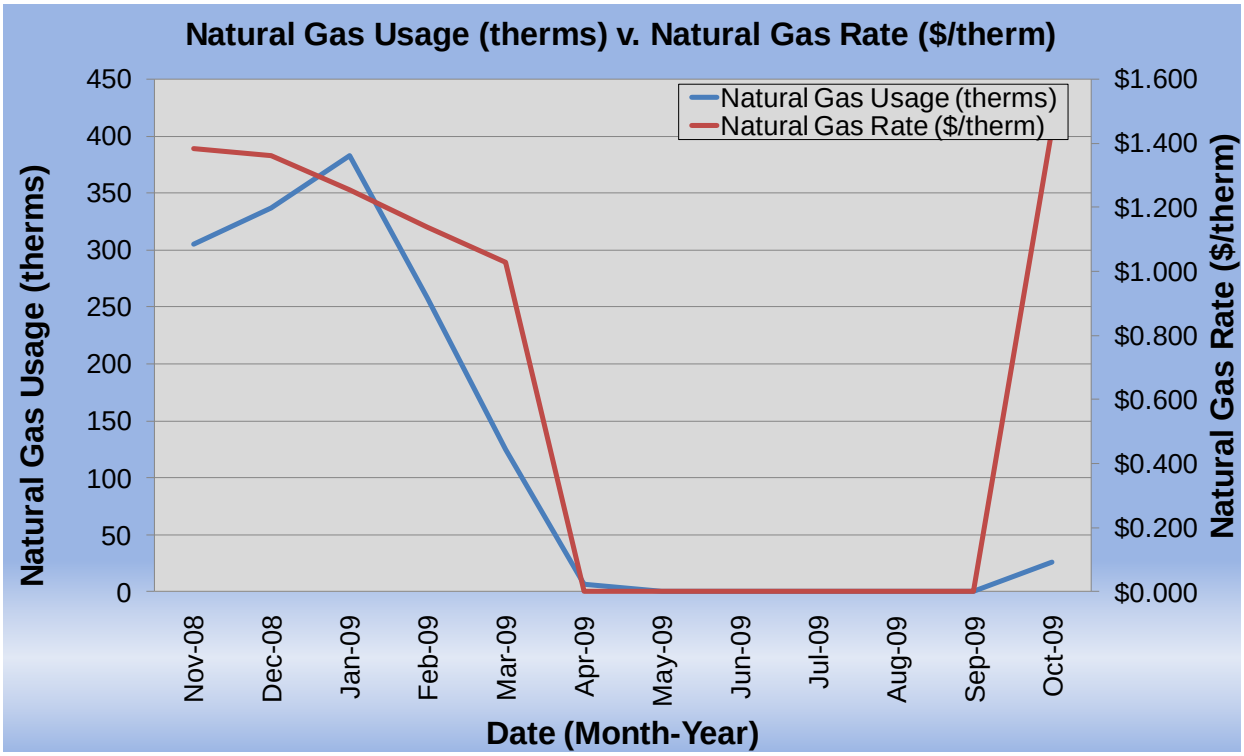
The following is a chart of the natural gas load profile for the building, peaking in the coldest months of the year and a chart showing natural gas consumption following the “heating degree days” curve. Some utility bills have more than one month estimated and combined.





6.2. Tariff Analysis

Currently, natural gas is provided to the Municipal Building via one gas meter with the PSE&G acting as the supply and also the transport company. Gas is provided by the PSE&G at a general and very competitive service rate. The suppliers' general service rate for natural gas charges a market-rate price based on use and the Municipal Building billing 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. Typically, the natural gas prices increase during the heating months when natural gas is used by the boiler and the furnace units. Some high gas price per therm fluctuations in the summer may be due to high energy costs that recently occurred and low use caps for the non-heating months. Thus the building pays for fixed costs such as meter reading charges during the summer months. Some of the cap payments are excluded from the following chart.

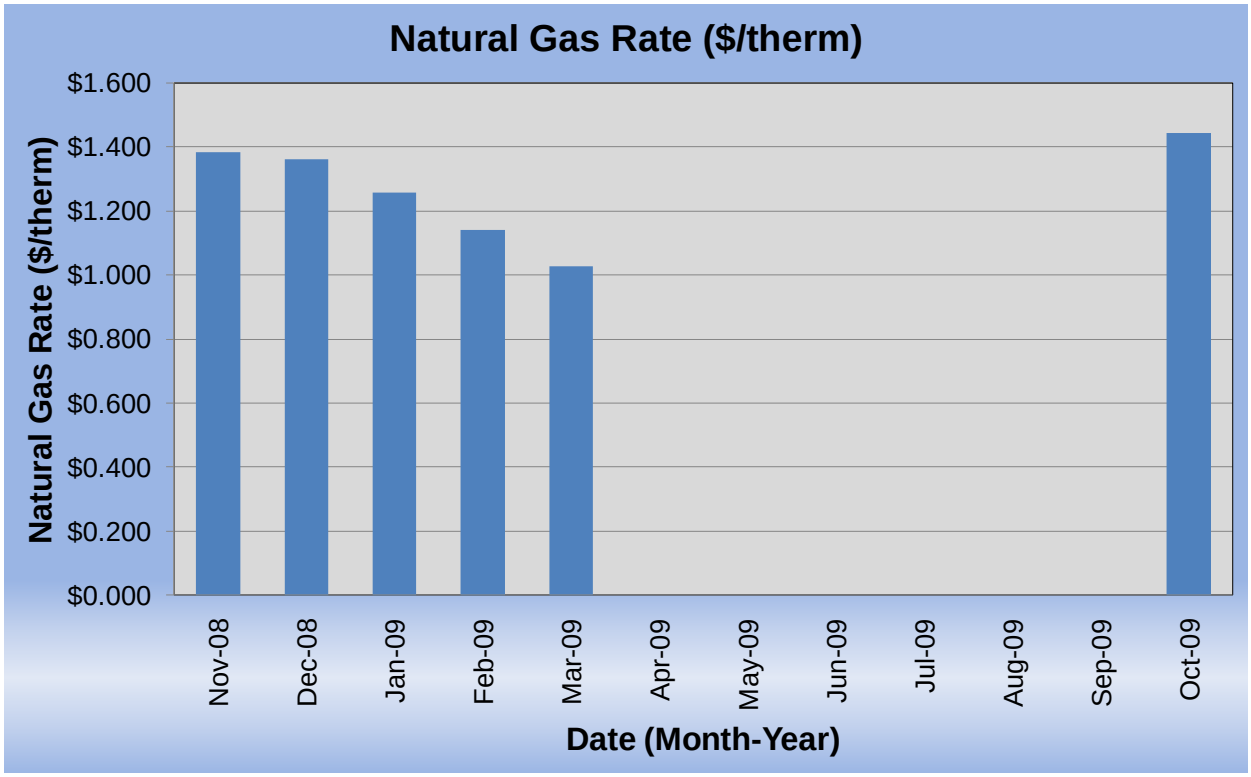


The Municipal Building is direct-metered and currently purchases electricity from the South River Electric Utility at a general service rate. The general service rate for electric charges is market-rate based on use and the Municipal Building does not track a breakdown of demand costs. Demand prices are generally 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 air conditioning systems.

6.3. Energy Procurement strategies

The Municipal Building receives natural gas via one incoming meter. PSE&G supplies the gas and transports it. There is not an ESCO engaged in the process. An Energy Services Company (ESCO) is a consultancy group that engages in a performance based contract with a client firm to implement measures which reduce energy consumption and costs in a technically and financially viable manner. Electricity is also purchased via one incoming meter directly for the

main Municipal Building from South River Electricity Company without an ESCO. SWA analyzed the utility rate for natural gas and electricity supply over an extended period. Electric rates were estimated by the Borough of South River over the most recent 12 month period. Natural gas bill analysis shows fluctuations up to 45% over the most recent 12 month period. Some of these fluctuations may have been caused by adjustments between estimated and actual meter readings, others may be due to unusual high and recent escalating energy costs. The average estimated NJ commercial utility rates for electric and gas are $0.150/kWh and $1.550/therm respectively. The Municipal Building annual utility costs are competitive when compared to the average estimated NJ commercial utility rates. SWA recommends that the Borough of South River further explore opportunities of purchasing both natural gas and electricity from ESCOs in order to reduce rate fluctuation and ultimately reduce the annual cost of energy for the Municipal Building. Appendix B contains a complete list of third party energy suppliers for the Borough of South River service area. The Borough of South River may want to consider partnering with other school districts, municipalities, boroughs and communities to aggregate a substantial electric and natural gas use for better leveraging in negotiations with ESCOs and of improving the pricing structures. This sort of activity is happening in many parts of the country and in New Jersey. Also, the Municipal Building would not be eligible for enrollment in a Demand Response Program, because there isn't the capability at this time to shed a minimum of 150 kW electric demand when requested by the utility during peak demand periods, which is the typical threshold for considering this option. The following chart show the Municipal Building monthly natural gas spending per unit of energy in 2009. Electric rates were estimated by the Borough at a constant rate of $0.130/kWh.



7. METHOD OF ANALYSIS

7.1. Assumptions and tools

Energy modeling tool:	established / standard industry assumptions, E-Quest
Cost estimates:	RS Means 2009 (Facilities Maintenance & Repair Cost Data) RS Means 2009 (Building Construction Cost Data) RS Means 2009 (Mechanical Cost Data) Published & established specialized equipment material & labor costs 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.

Appendix A: Lighting Study

Location			Existing Fixture Information											Retrofit Information												Annual Savings		
Marker	Floor	Room Identification	Fixture Type	Ballast	Lamp Type	# of Fixtures	# of Lamps per Fixture	Watts per Lamp	Controls	Operational Hours per Day	Operational Days per Year	Ballast Wattage	Total Watts	Energy Use kWh/year	Category	Fixture Type	Lamp Type	Ballast	Controls	# of Fixtures	# of Lamps per Fixture	Watts per Lamp	Operational Hours per Day	Operational Days per Year	Ballast Watts	Total Watts	Energy Use kWh/year	Fixture Savings (kWh)	Controls Savings (kWh)	Total Savings (kWh)
1	1	office (101)	Recessed	E	4'T8	8	3	32	S	8	260	10	848	1,764	N/A	Recessed	4'T8	E	S	8	3	32	8	260	10	848	1764	0	0	0
2	1	office (102)	Recessed	E	4'T8	3	3	32	S	8	260	10	318	661	N/A	Recessed	4'T8	E	S	3	3	32	8	260	10	318	661	0	0	0
3	1	office (103)	Recessed	E	4'T8	4	3	32	S	8	260	10	424	882	N/A	Recessed	4'T8	E	S	4	3	32	8	260	10	424	882	0	0	0
4	1	office (104)	Recessed	E	4'T8	3	3	32	S	8	260	10	318	661	N/A	Recessed	4'T8	E	S	3	3	32	8	260	10	318	661	0	0	0
5	1	office (105)	Recessed	E	4'T8	3	3	32	S	8	260	10	318	661	N/A	Recessed	4'T8	E	S	3	3	32	8	260	10	318	661	0	0	0
6	1	women's toilet (106)	Recessed	E	4'T8	2	3	32	S	8	260	10	212	441	N/A	Recessed	4'T8	E	S	2	3	32	8	260	10	212	441	0	0	0
7	1	men's toilet (107)	Recessed	E	4'T8	2	3	32	S	8	260	10	212	441	N/A	Recessed	4'T8	E	S	2	3	32	8	260	10	212	441	0	0	0
8	1	janitor closet (108)	Recessed	E	4'T8	2	3	32	S	8	260	10	212	441	N/A	Recessed	4'T8	E	S	2	3	32	8	260	10	212	441	0	0	0
9	1	executive suite (109)	Recessed	E	4'T8	8	3	32	S	8	260	10	848	1,764	N/A	Recessed	4'T8	E	S	8	3	32	8	260	10	848	1764	0	0	0
10	1	utive suite - supply closet	Recessed	E	4'T8	1	3	32	S	8	260	10	106	220	N/A	Recessed	4'T8	E	S	1	3	32	8	260	10	106	220	0	0	0
11	1	conference room (110)	Recessed	E	4'T8	5	3	32	S	8	260	10	530	1,102	C	Recessed	4'T8	E	OS	5	3	32	6	260	10	530	827	0	276	276
12	1	conference room (110)	Recessed	N	Inc	8	1	150	D	8	260	0	1,200	2,496	C	Recessed	CFL	N	OS	8	1	150	6	260	0	1200	1872	0	624	624
13	1	hall (111)	Recessed	E	4'T8	3	3	32	S	8	260	10	318	661	N/A	Recessed	4'T8	E	S	3	3	32	8	260	10	318	661	0	0	0
14	1	office (112)	Recessed	E	4'T8	7	3	32	S	8	260	10	742	1,543	N/A	Recessed	4'T8	E	S	7	3	32	8	260	10	742	1543	0	0	0
15	1	tel/mech room (113)	Recessed	E	4'T8	2	3	32	S	8	260	10	212	441	N/A	Recessed	4'T8	E	S	2	3	32	8	260	10	212	441	0	0	0
16	1	safe room (114)	Recessed	E	4'T8	2	3	32	S	2	260	10	212	110	N/A	Recessed	4'T8	E	S	2	3	32	2	260	10	212	110	0	0	0
17	1	break/copy/storage (115	Recessed	E	4'T8	3	3	32	S	8	260	10	318	661	N/A	Recessed	4'T8	E	S	3	3	32	8	260	10	318	661	0	0	0
18	1	office (116)	Recessed	E	4'T8	4	3	32	S	8	260	10	424	882	N/A	Recessed	4'T8	E	S	4	3	32	8	260	10	424	882	0	0	0
19	1	office (117)	Recessed	E	4'T8	6	3	32	S	8	260	10	636	1,323	N/A	Recessed	4'T8	E	S	6	3	32	8	260	10	636	1323	0	0	0
20	1	office (118)	Recessed	E	4'T8	4	3	32	S	8	260	10	424	882	N/A	Recessed	4'T8	E	S	4	3	32	8	260	10	424	882	0	0	0
21	1	office (119)	Recessed	E	4'T8	4	3	32	S	8	260	10	424	882	N/A	Recessed	4'T8	E	S	4	3	32	8	260	10	424	882	0	0	0
22	1	consultation desk (120)	Recessed	E	4'T8	1	3	32	S	8	260	10	106	220	N/A	Recessed	4'T8	E	S	1	3	32	8	260	10	106	220	0	0	0
23	1	consultation desk (120)	Recessed	E	CFL	2	1	32	S	8	260	0	64	133	N/A	Recessed	CFL	E	S	2	1	32	8	260	0	64	133	0	0	0
24	1	office (121)	Recessed	E	4'T8	3	3	32	S	8	260	10	318	661	N/A	Recessed	4'T8	E	S	3	3	32	8	260	10	318	661	0	0	0
25	1	open office space (123)	Recessed	E	4'T8	45	3	32	S	8	260	10	4,770	9,922	N/A	Recessed	4'T8	E	S	45	3	32	8	260	10	4770	9922	0	0	0
26	1	open office space (123)	Exit Sign	N	LED	5	1	5	N	24	365	1	30	263	N/A	Exit Sign	LED	N	N	5	1	5	24	365	1	30	263	0	0	0
27	1	public lobby (124)	Recessed	E	CFL	11	2	26	S	8	260	0	572	1,190	N/A	Recessed	CFL	E	S	11	2	26	8	260	0	572	1190	0	0	0
28	1	public lobby (124)	Exit Sign	N	LED	1	1	5	N	24	365	1	6	53	N/A	Exit Sign	LED	N	N	1	1	5	24	365	1	6	53	0	0	0
29	1	public toilet (125)	Recessed	E	4'T8	2	3	32	S	8	260	10	212	441	N/A	Recessed	4'T8	E	S	2	3	32	8	260	10	212	441	0	0	0
30	1	vestbule (126)	Recessed	E	CFL	4	1	32	S	8	260	0	128	266	N/A	Recessed	CFL	E	S	4	1	32	8	260	0	128	266	0	0	0
31	1	main entrance (exterior)	exterior	N	MH	2	1	70	PC	12	365	18	176	771	PSMH	Exterior	PSMH	N	PC	2	1	45	12	365	10	110	482	289	0	289
32	1	main entrance (exterior)	exterior	M	8'T12	4	1	80	PC	12	365	20	400	1,752	T8	Exterior	8'T8	E	PC	4	1	59	12	365	6	260	1139	613	0	613
33	1	main entrance (exterior)	exterior	N	MH	2	1	70	PC	12	365	18	176	771	PSMH	Exterior	PSMH	N	PC	2	1	45	12	365	10	110	482	289	0	289
34	1	main entrance (exterior)	exterior	N	MH	2	1	400	PC	12	365	100	1,000	4,380	PSMH	Exterior	PSMH	N	PC	2	1	275	12	365	59	668	2926	1454	0	1454
35	1	rear entrance (exterior)	exterior	N	MH	1	1	70	PC	12	365	18	88	385	PSMH	Exterior	PSMH	N	PC	1	1	45	12	365	10	55	241	145	0	145
Totals:						169	84	1,708				416	#####	40,130						169	84	1,487			337	16,665	36440	**2,790**	**900**	**3,690**

Rows Highlighed Yellow Indicate an Energy Conservation Measure is recommended for that space

Legend:

Fixture Type	Lamp Type	Control Type	Ballast Type	Retrofit Category
Exit Sign	LED	N (None)	N/A (None)	N/A (None)
Screw-in	Inc (Incandescent)	S (Switch)	E (Electronic)	T8 (Installl new T8)
Pin	1'T5	OS (Occupancy Sensor)	M (Magnetic)	T5 (Install new T5)
Parabolic	2'T5	T (Timer)		CFL (Install new CFL)
Recessed	3'T5	PC (Photocell)		LEDex (Install new LED Exit)
2'U-shape	4'T5	D (Dimming)		LED (Install new LED)
Circiline	2'T8	DL (Daylight Sensor)		D (Delamping)
Exterior	3'T8	M (Microphonic Sensor)		C (Controls Only)
HID (High Intensity Discharge)	4'T8			
	6'T8			
	8'T8			
	2'T12			
	3'T12			
	4'T12			
	6'T12			
	8'T12			
	CFL (Compact Fluorescent Lightbulb)			
	MR16			
	Halogen			
	MV (Mercury Vapor)			
	MH (Metal Halide)			
	HPS (High Pressure Sodium			
	LPS (Low Pressure Sodium)			

Proposed Lighting Summary Table			
Total Surface Area (SF)	5,660		
Average Power Cost ($/kWh)	0.1300		
Exterior Lighting	**Existing**	**Proposed**	**Savings**
Exterior Annual Consumption (kWh)	8,059	5,269	**2,790**
Exterior Power (watts)	1,840	1,203	**637**
Total Lighting	**Existing**	**Proposed**	**Savings**
Annual Consumption (kWh)	40,130	36,440	**3,690**
Lighting Power (watts)	17,302	16,665	**637**
Lighting Power Density (watts/SF)	3.06	2.94	**0.11**
Estimated Cost of Fixture Replacement ($)	440		
Estimated Cost of Controls Improvements ($)	5,630		
Total Consumption Cost Savings ($)	**6,070**		

Appendix B: Third Party Energy Suppliers (ESCOs)

http://www.state.nj.us/bpu/commercial/shopping.html

PSE&G NATURAL GAS SERVICE TERRITORY Last Updated: 06/15/09		
Cooperative Industries 412-420 Washington Avenue Belleville, NJ 07109 800-6BUYGAS (6-289427) www.cooperativenet.com	**Direct Energy Services, LLP** 120 Wood Avenue, Suite 611 Iselin, NJ 08830 866-547-2722 www.directenergy.com	**Dominion Retail, Inc.** 395 Highway 170 - Suite 125 Lakewood, NJ 08701 866-275-4240 http://retail.dom.com
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701 800-805-8586 www.gesc.com	**UGI Energy Services, Inc. d/b/a GASMARK** 704 East Main Street, Suite 1 Moorestown, NJ 080111 856-273-9995 www.ugienergyservices.com	**Great Eastern Energy** 116 Village Riva, Suite 200 Princeton, NJ 08540 888-651-4121 www.greateastern.com
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095 800-437-7872 www.hess.com	**Hudson Energy Services, LLC** 920 Route 17 South Ridgewood, NJ 07450 877- Hudson 9 www.hudsonenergyservices.com	**Intelligent Energy** 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024 800-724-1880 www.intelligentenergy.org
Keil & Sons 1 Bergen Blvd. Fairview, NJ 07002 1-877-Systrum www.systrumenergy@aol.com	**Metromedia Energy, Inc.** 6 Industrial Way Eatontown, NJ 07724 877-750-7046 www.metromediaenergy.com	**Metro Energy Group, LLC** 14 Washington Place Hackensack, NJ 07601 888-111-Metro www.metroenergy.com
MxEnergy, Inc. 510 Thornall Street, Suite 270 Edison, NJ 088327 800-375-1277 www.mxenergy.com	**NATGASCO (Mitchell Supreme)** 1112 Freeman Street Orange, NJ 07050 800-840-4GAS www.natgasco.com	**Pepco Energy Services, Inc.** 112 Main Street Lebanon, NJ 08833 800-363-7499 www.pepco-services.com
PPL EnergyPlus, LLC 811 Church Road - Office 105 Cherry Hill, NJ 08002 800-281-2000 www.pplenergyplus.com	**Sempra Energy Solutions** The Mac-Cali Building 581 Main Street, 8th fl. Woodbridge, NJ 07095 877-273-6772 800-2 SEMPRA www.semprasolutions.com	**South Jersey Energy Company** One South Jersey Plaza, Route 54 Folsom, NJ 08037 800-756-3749 www.sjindustries.com/sje.htm
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 011128 800-225-1560 www.spragueenergy.com	**Stuyvesant Energy LLC** 10 West Ivy Lane, Suite 4 Englewood, NJ 07631 800-646-64111 www.stuyfuel.com	**Woodruff Energy** 73 Water Street Bridgeton, NJ 08302 800-5111-1121 www.woodruffenergy.com

Appendix C

Glossary and Method of Calculations

Glossary of ECM Terms

.

Net ECM Cost: The net ECM cost is the cost experienced by the customer, which is typically the total cost (materials + labor) of installing the measure minus any available incentives. Both the total cost and the incentive amounts are expressed in the summary for each ECM.

Annual Energy Cost Savings (AECS): This value is determined by the audit firm based on the calculated energy savings (kWh or Therm) of each ECM and the calculated energy costs of the building.

Lifetime Energy Cost Savings (LECS): This measure estimates the energy cost savings over the lifetime of the ECM. It can be a simple estimation based on fixed energy costs. If desired, this value can factor in an annual increase in energy costs as long as the source is provided.

Simple Payback: This is a simple measure that displays how long the ECM will take to break-even based on the annual energy and maintenance savings of the measure.

ECM Lifetime: This is included with each ECM so that the owner can see how long the ECM will be in place and whether or not it will exceed the simple payback period. Additional guidance for calculating ECM lifetimes can be found below. This value can come from manufacturer's rated lifetime or warranty, the ASHRAE rated lifetime, or any other valid source.

Operating Cost Savings (OCS): This calculation is an annual operating savings for the ECM. It is the difference in the operating, maintenance, and / or equipment replacement costs of the existing case versus the ECM. In the case where an ECM lifetime will be longer than the existing measure (such as LED lighting versus fluorescent) the operating savings will factor in the cost of replacing the units to match the lifetime of the ECM. In this case or in one where one-time repairs are made, the total replacement / repair sum is averaged over the lifetime of the ECM.

Return on Investment (ROI): The ROI is expresses the percentage return of the investment based on the lifetime cost savings of the ECM. This value can be included as an annual or lifetime value, or both.

Net Present Value (NPV): The NPV calculates the present value of an investment's future cash flows based on the time value of money, which is accounted for by a discount rate (assumes bond rate of 3.2%).

Internal Rate of Return (IRR): The IRR expresses an annual rate that results in a break-even point for the investment. If the owner is currently experiencing a lower return on their capital than the IRR, the project is financially advantageous. This measure also allows the owner to compare ECMs against each other to determine the most appealing choices.

Calculation References

ECM = Energy Conservation Measure
AOCS = Annual Operating Cost Savings
AECS = Annual Energy Cost Savings
LOCS = Lifetime Operating Cost Savings
LECS = Lifetime Energy Cost Savings
LCS = Lifetime Cost Savings

NPV = Net Present Value
IRR = Internal Rate of Return
DR = Discount Rate

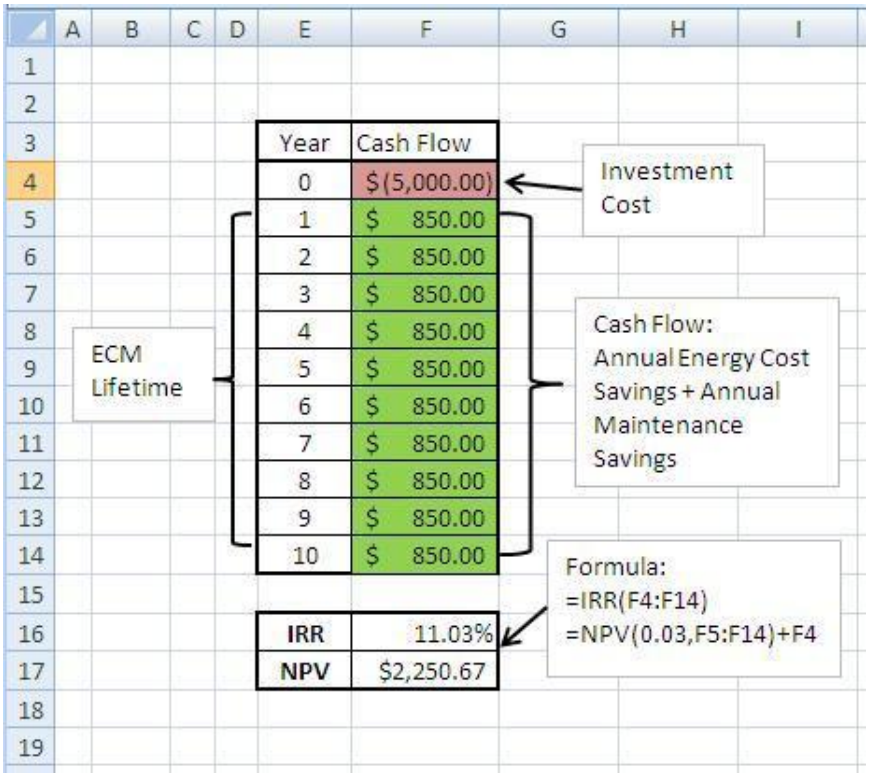
Net ECM Cost = Total ECM Cost – Incentive
LECS = AECS X ECM Lifetime
AOCS = LOCS / ECM Lifetime
LCS = LOCS+LECS

Note: The lifetime operating cost savings are all avoided operating, maintenance, and / or component replacement costs over the lifetime of the ECM. This can be the sum of any annual operating savings, recurring or bulk (i.e. one-time repairs) maintenance savings, or the savings that comes from avoiding equipment replacement needed for the existing measure to meet the lifetime of the ECM (e.g. lighting change outs).

Simple Payback = Net ECM Cost / (AECS + AOCS)
Lifetime ROI = (LECS + LOCS – Net ECM Cost) / Net ECM Cost
Annual ROI = (Lifetime ROI / Lifetime) = (AECS + OCS) / Net ECM Cost – 1 / Lifetime
It is easiest to calculate the NPV and IRR using a spreadsheet program like Excel.

Excel NPV and IRR Calculation

In Excel, function =IRR(values) and =NPV(rate, values) are used to quickly calculate the IRR and NPV of a series of annual cash flows. The investment cost will typically be a negative cash flow at year 0 (total cost - incentive) with years 1 through the lifetime receiving a positive cash flow from the annual energy cost savings and annual maintenance savings. The calculations in the example below are for an ECM that saves $850 annually in energy and maintenance costs (over a 10 year lifetime) and takes $5,000 to purchase and install after incentives:



ECM and Equipment Lifetimes

Determining a lifetime for equipment and ECM's can sometimes be difficult. The following table contains a list of lifetimes that the NJCEP uses in its commercial and industrial programs. Other valid sources are also used to determine lifetimes, such as the DOE, ASHRAE, or the manufacturer's warranty.
Lighting is typically the most difficult lifetime to calculate because the fixture, ballast, and bulb can all have different lifetimes. Essentially the ECM analysis will have different operating cost savings (avoided equipment replacement) depending on which lifetime is used.

When the bulb lifetime is used (rated burn hours / annual burn hours), the operating cost savings is just reflecting the theoretical cost of replacing the existing case bulb and ballast over the life of the recommended bulb. Dividing by the bulb lifetime will give an annual operating cost savings.

When a fixture lifetime is used (e.g. 15 years) the operating cost savings reflects the avoided bulb and ballast replacement cost of the existing case over 15 years minus the projected bulb and ballast replacement cost of the proposed case over 15 years. This will give the difference of the equipment replacement costs between the proposed and existing cases and when divided by 15 years will give the annual operating cost savings.

.

NJCEP C & I Lifetimes

Measure	Measure Life
Commercial Lighting — New	15
Commercial Lighting — Remodel/Replacement	15
Commercial Custom — New	18
Commercial Chiller Optimization	18
Commercial Unitary HVAC — New - Tier 1	15
Commercial Unitary HVAC — Replacement - Tier 1	15
Commercial Unitary HVAC — New - Tier 2	15
Commercial Unitary HVAC — Replacement Tier 2	15
Commercial Chillers — New	25
Commercial Chillers — Replacement	25
Commercial Small Motors (1-10 HP) — New or Replacement	20
Commercial Medium Motors (11-75 HP) — New or Replacement	20
Commercial Large Motors (76-200 HP) — New or Replacement	20
Commercial VSDs — New	15
Commercial VSDs — Retrofit	15
Commercial Comprehensive New Construction Design	18
Commercial Custom — Replacement	18
Industrial Lighting — New	15
Industrial Lighting — Remodel/Replacement	15
Industrial Unitary HVAC — New - Tier 1	15
Industrial Unitary HVAC — Replacement - Tier 1	15
Industrial Unitary HVAC — New - Tier 2	15
Industrial Unitary HVAC — Replacement Tier 2	15
Industrial Chillers — New	25
Industrial Chillers — Replacement	25
Industrial Small Motors (1-10 HP) — New or Replacement	20
Industrial Medium Motors (11-75 HP) — New or Replacement	20
Industrial Large Motors (76-200 HP) — New or Replacement	20
Industrial VSDs — New	15
Industrial VSDs — Retrofit	15
Industrial Custom — Non-Process	18
Industrial Custom — Process	10
Small Commercial Gas Furnace — New or Replacement	20
Small Commercial Gas Boiler — New or Replacement	20
Small Commercial Gas DHW — New or Replacement	10
C&I Gas Absorption Chiller — New or Replacement	25
C&I Gas Custom — New or Replacement (Engine Driven Chiller)	25
C&I Gas Custom — New or Replacement (Gas Efficiency Measures)	18
O&M savings	3
Compressed Air (GWh participant)	8