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Local Government Energy Program
Energy Audit Report

For

City of New Brunswick
New Brunswick Water Utility- Filtration Building

1 Comstock St
New Brunswick, NJ 08901

Project Number: LGEA63

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INTRODUCTION

On April 30th, Steven Winter Associates, Inc. (SWA) and PMK Group, a business unit of Birdsall Services Group (BSG-PMK), performed an energy audit and assessment of the New Brunswick Water Utility Filtration 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 partly two-story, (including a partial basement), 12,000 square feet Water Utility Filtration building was originally constructed in 2008 with no additions or major alterations to date. It houses offices and a meeting area on the second floor with membrane filtration equipment located throughout the ground floor.

The New Brunswick Water Utility Filtration Building is occupied by approximately 1-2 employees at any given time 24/7.

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 New Brunswick Water Utility Filtration Building in The City of New Brunswick, NJ 08901.

Based on the field visit performed by Steven Winter Associates (SWA) and PMK staff on April 30th, 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, May, 2009 through April, 2010, the New Brunswick Water Utility Filtration Building consumed a total of 4,239,083 kWh of electricity for a total cost of $433,777. In the most recent full year of natural gas data collected, March, 2009 through February, 2010, 10,110 therms of gas were consumed for a total cost of $12,334. With electricity and natural gas combined, the building consumed 1267 MMBtus of energy at a total cost of $446,111.

SWA/BSG-PMK has entered energy information about the New Brunswick Water Utility Filtration Building in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The building was classified as a Other building preventing it from receiving a performance rating. 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 1290 kBtu/ft^{2}yr compared to the national average of a similar building consuming 104 kBtu/ft^{2}yr. Implementing the recommendations included in this report will reduce the building energy consumption by approximately 14 kBtu/ft^{2}yr.

Based on the assessment of the New Brunswick Water Utility Filtration 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:

At this time there are no capital improvements recommended by SWA/BSG-PMK.

Category II: Operations & Maintenance:

Due to the age and condition of the building, there are no operations and maintenance recommendations at this time.

Category III: Energy Conservation Measures:

At this time, SWA/BSG-PMK highly recommends a total of **2** Energy Conservation Measures (ECMs) for the New Brunswick Water Utility Filtration Building that are summarized in the following table. The total investment cost for these ECMs, with incentives, is **$270,120** (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 **$28,144** with an aggregated simple payback of approximately **10 years**. SWA/BSG-PMK

estimates that implementing the highly recommended ECMs will reduce the carbon footprint of the facility by **65,896 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 $1,400.75.

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	$0.10 $/kWh
Energy price escalation rate:	0% per DOE FEMP guidelines	Gas rate	$1.22 $/therm

Avg. Annual Demand: 0.00109 Area of Building (SF): 12,000

Table 1 - Recommended 0-5 Year Payback ECMs

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO_2 Reduced, lbs/yr
1	Lighting Upgrades	Empirical Data	$160	$40	$120	456	0.04	0	0.13	$0	$46	15	$536	2.63	347%	23%	38%	$424	624
TOTAL			$160	$40	$120	456	0.04	0	0.13	$0.00	$46	-	$536	2.63	-	-	-	$424	624

Table 2 - Recommended 5-10 Year Payback ECMs

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO_2 Reduced, lbs/yr
2	34 kW Roof-Mounted PV System	Similar Projects	$315,000	$45,000	$270,000	47,644	4.32	0	13.55	$0	$28,098	30	$536,764	9.61	99%	3%	10%	$280,733	65,272
TOTAL			$315,000	$45,000	$270,000	47,644	4.32	0	13.55	$0.00	$28,098	-	$536,764	9.61	-	-	-	$280,733	65,272

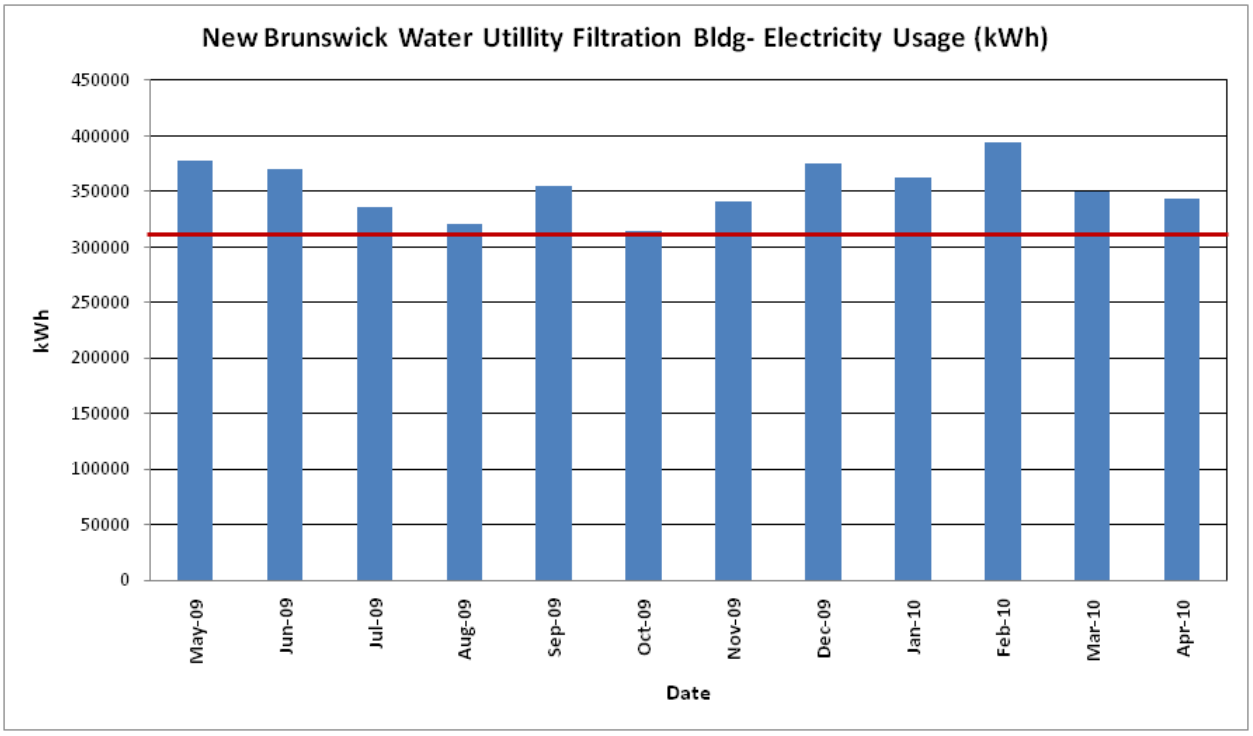
1. HISTORIC ENERGY CONSUMPTION

1.1. Energy Usage and Cost Analysis

SWA/BSG-PMK analyzed utility bills that were received from the utility company supplying the New Brunswick Water Utility Filtration Building with electric and natural gas from May, 2009 through April, 2010.

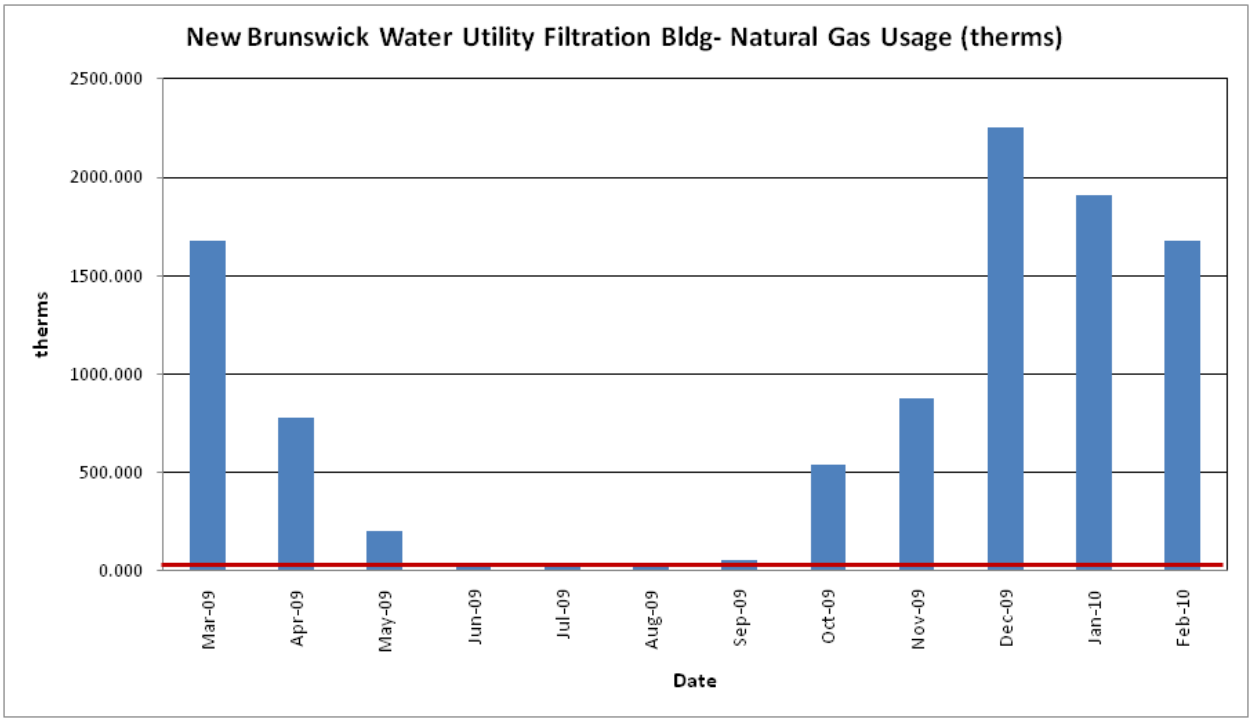
Electricity – The New Brunswick Water Utility Filtration Building is currently served by one electric meter. The facility currently receives electricity transmission service from Public Service Electric & Gas and electricity supply service from Direct Energy at **an average rate of $0.10/kWh** based on 12 months of utility bills from May, 2009 through April, 2010. The facility consumed **approximately 4,239,083 kWh or $433,777 worth of electricity** in the previous year with an average monthly demand of 667 kW.

The following charts show electricity usage for the New Brunswick Water Utility Filtration Building based on utility bills for the billing analysis period. The red line indicates the estimated base-load in kWh.



Natural Gas – The New Brunswick Water Utility Filtration Building 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 $1.22/therm** based on 12 months of utility bills for March, 2009 through February, 2010. The facility consumed **approximately 10,110 therms or $12,334 worth of natural gas** in the previous year.

The following charts show the natural gas usage for the New Brunswick Water Utility Filtration Building based on utility bills for the analysis period of March, 2009 through February, 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/or cooking needs. The natural gas usage above the red line shows the amount of natural gas used for heating.

1.2. Utility Rate

The New Brunswick Water Utility Filtration Building currently receives electricity transmission service from Public Service Electric & Gas and electricity supply service from Direct Energy at a general service market rate for electricity use (kWh) with (kW) demand charge. The facility currently pays an average rate of approximately $0.10/kWh based on the most recent 12 months of utility bills.

The New Brunswick Water Utility Filtration Building 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 $1.22/therm based on the most recent 12 months of utility bills.

1.3. Energy Benchmarking

SWA/BSG-PMK has entered energy information about the New Brunswick Water Utility Filtration Building 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 Other space preventing it from earning a performance rating which can be used to achieve an Energy Star building certification.

The Site Energy Use Intensity is 1290 kBtu/sq.ft/yr compared to the national average of buildings classified as Other space consuming 104 kBtu/sq.ft./yr. Implementing this report's recommended Energy Conservations Measures (ECMs) will reduce use by approximately 14 kBtu/sq.ft./yr.

SWA/BSG-PMK has created the Portfolio Manager site information for New Brunswick Water Utility Filtration Building. 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 Water Utility- Filtration Bldg

Building ID: 2377569
For 12-month Period Ending: April 30, 2010[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: July 07, 2010

Facility	Facility Owner	Primary Contact for this Facility
New Brunswick Water Utility- Filtration Bldg 1 Comstock 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: 2007
Gross Floor Area (ft²): 12,000

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

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	14,463,751
Natural Gas (kBtu)[4]	1,010,988
Total Energy (kBtu)	15,474,739

Energy Intensity[5]	
Site (kBtu/ft²/yr)	1290
Source (kBtu/ft²/yr)	4114

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	2,256

Electric Distribution Utility
Public Service Elec & Gas Co

National Average Comparison	
National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	1832%
Building Type	Other

Stamp of Certifying Professional

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

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 partly two-story, (including a partial basement), 12,000 square feet Water Utility Filtration building was originally constructed in 2008 with no additions or major alterations to date. It houses offices and a meeting area on the second floor with membrane filtration equipment located throughout the ground floor.


Front Façade


Left Side Façade


Rear Façade


Right Side Façade

2.2. Building occupancy profiles

Its occupancy is approximately 1-2 employees on an as-needed basis 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 split-face concrete block over concrete block with 3 inches of loose-fill cellulose cavity insulation in the office area. The interior is mostly exposed painted concrete block or gypsum drywall in the office area.

Note: Wall insulation levels could visually be verified in the field by non-destructive methods.

Exterior and interior wall surfaces were inspected during the field audit. They were found to be in overall good condition with no signs of uncontrolled moisture, air-leakage or other energy-compromising issues.

2.3.2. Roof

The building's roof is predominantly a flat, no parapet type over steel decking, with a dark-colored EPDM single membrane finish. It is original. Two inches of foam board roof insulation throughout and additional six inches of acoustic ceiling tile applied fiberglass batt 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 good condition, with no signs of uncontrolled moisture, air-leakage or other energy-compromising issues.

2.3.3. Base

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

Slab/perimeter insulation levels could not be verified in the field and are based on available construction plans.

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 good 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.
Fixed type windows with an insulated aluminum frame, tinted double glazing and some interior shading devices. The windows are located throughout the building and are original.

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 good condition with no signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

2.3.5. Exterior Doors

The building contains two different types of exterior doors.

- Glass with aluminum/steel frame type exterior doors. They are located throughout the building and are original..
- overhead type exterior doors. They are located throughout the building and are original..

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 good 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, considering the building's use and occupancy, 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

Make-up air unit

2.4.1.Heating

A make-up air-unit with reclaim heat exchanger, custom manufactured in 2007 by Energy Labs, Inc., contains a gas fired indirect heating sections that conditions the filtration room. The furnace has a heating capacity of 2,190 MBH and is 79.9% efficient. The 2nd floor is heated by an 86 MBH, 95% efficient Lennox gas furnace.


Lennox gas furnace

2.4.2.Cooling

The 2nd floor is cooled by a 4-ton Lennox condensing unit, which feeds a cooling coil located on the furnace.

2.4.3.Ventilation

The two blowers are serviced by two Endustra Filter wall-mounted exhaust fans. The filtration room is vented by a Loren Cook 252 CFM gravity intake cap and four (4) Loren Cook exhaust fans: EF-1, rated at 2,500 CFM with a ½ HP motor; EF-2 and EF-3, each rated at 10,000 CFM with 1.5 HP motors; and EF-4, rated at 75 CFM with a 1/20 HP motor. The Energy Labs make-up air unit serves the filtration room, and has two (2) 30 HP supply air fans, (2) 20 HP return exhaust air fans, and is rated at 40,000 CFM.

2.4.4. Domestic Hot Water

Domestic hot water is provided by a 250 gallon, 399 MBH Power VT natural gas water heater, installed in 2007.

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 T8 Fluorescent fixtures with electronic ballasts and a number of Metal Halide fixtures.
Category III Recommendation - ECM 1: Recommend retrofiting all incandescent exit signs with LED technology. This is outlined in Appendix A.

2.5.2. Appliances and Process

Appliances:

Appliances that are over 10 years of age should be replaced with newer efficient models with the Energy Star label. 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.

In this facility, there are (2) water fountains a coffee maker.

Process:

The filtration room houses nine (9) Flowserve pumps with Emerson motors. There are two (2) 3,524 GPM backwash pumps with motors rated at 60 HP and 94.5% efficiency. Four (4) filtrate pumps have motors rated at 50 HP and 92.4% efficiency. Three (3) 4,430 GPM feed pumps have motors rated at 60 HP and 94.5% efficiency. Also in the filtration room are two (2) Atlas Copco air compressors in the filtration room, rated at 33.1 CFM and 10 HP, and two Fluid Engineering strainers with ¼ HP, 55% efficient Blador motors.

Filtrate pump

In the scour room, there are two (2) Continental Industries blowers with 100 HP, 95% efficient Baldor motors.

All blowers and pumps were found to be in good condition with premium-efficiency motors.

2.5.3.Elevators

There is one elevator at this facility.

3. Building Systems Equipment List

New Brunswick Water Utility - Filtration Building							
Building System	Description	Locations	Model #	Fuel	Space Served	Year Installed	Estimtaed. Remaining Useful Life %
Domestic Hot Water	Water heater, 250 gallons, 399 MBH	Scour room	Power VT, M# 560 N 250A-PV, S# 0907122610	Natural gas	Entire building	Approx. 2007	80%
HVAC	MUA-1: Make-up air unit, (2) 30 HP supply air fans, (2) 20 HP return exhaust air fans, 40,000 CFM, gas heat (2,190 MBH, 79.9% efficient)	Outside, behind building	Energy Labs, Inc., M# C132172-FG-L, S# 0707-3228-1	Electricity	Filtration room	2007	85%
Heating/ Cooling	Furnace w/ cooling coil, 86 MBH heat, 95% efficient	2nd-floor utility room	Lennox; M# G51MP-48-090-07, S# 5907F22732 (furnace); M# C33-48C-2F-3, S# 6007D40899 (cooling coil)	Natural gas/ electricity	2nd floor	2007	83%
Pumping	Backwash Pump #1: 3,524 GPM, 50' head, 60 HP, 1,190 RPM	Filtration room	Flowserve, M# 10MF16-FR6A, S# 0706MS004500-2	Electricity	Process	2007	85%
	Pump motor: 60 HP, 1,190 RPM, 94.5% efficiency		Emerson, M# 6212-2Z-J, Catelog # D60V3CS-P, ID# L07 20074295-100R-02				
Pumping	Backwash Pump #2: 3,524 GPM, 50' head, 60 HP, 1,190 RPM	Filtration room	Flowserve, M# 10MF16-FR6A, S# 0706MS004500-1	Electricity	Process	2007	85%
	Pump motor: 60 HP, 1,190 RPM, 94.5% efficiency		Emerson, M# 6212-2Z-J, Catelog # D60V3CS-P, ID# L07 20074295-100R-01				
Pumping	Filtrate Pump (Cell #1)	Filtration room	Flowserve, M# MK3 STD, S# 0307-2061 A	Electricity	Process	2007	85%

	Pump motor: 50 HP, 890 RPM, 92.4% efficiency		Emerson, M# 6212-2Z-J, Catelog # D50V4C-P, ID# L06 20074837-100R-02				
Pumping	Filtrate Pump (Cell #2)	Filtration room	Flowserve, M# MK3 STD, S# 0307-2061 B	Electricity	Process	2007	85%
	Pump motor: 50 HP, 890 RPM, 92.4% efficiency		Emerson, M# 6212-2Z-J, Catelog # D50V4C-P, ID# L06 20074837-100R-04				
Pumping	Filtrate Pump (Cell #3)	Filtration room	Flowserve, M# MK3 STD, S# 0307-2061 C	Electricity	Process	2007	85%
	Pump motor: 50 HP, 890 RPM, 92.4% efficiency		Emerson, M# 6212-2Z-J, Catelog # D50V4C-P, ID# L06 20074837-100R-03				
Pumping	Filtrate Pump (Cell #4)	Filtration room	Flowserve, M# MK3 STD, S# 0307-2061 D	Electricity	Process	2007	85%
	Pump motor: 50 HP, 890 RPM, 92.4% efficiency		Emerson, M# 6212-2Z-J, Catelog # D50V4C-P, ID# L06 20074837-100R-01				
Pumping	Master Control Panel	Filtration room	Siemens	Electricity	Cells 1-4	2007	85%
Pumping	Feed Pump #P-104: 4,430 GPM, 60 HP, 40' head, 1,190 RPM	Filtration room	Flowserve, M# 10MF16-FR6A, S# 0706MS004499-3	Electricity	Process	Approx. 2007	85%
	Feed pump motor, 60 HP, 1,190 RPM, 94.5% efficiency		Emerson, M# 6212-2Z-J, Cat. # D60V3CS-P, ID# L06 20074299-100R-03				
Pumping	Feed Pump #P-102: 4,430 GPM, 60 HP, 40' head, 1,190 RPM	Filtration room	Flowserve, M# 10MF16-FR6A, S# 0706MS004499-2	Electricity	Process	Approx. 2007	85%

	Feed pump motor, 60 HP, 1,190 RPM, 94.5% efficiency		Emerson, M# 6212-2Z-J, Cat. # D60V3CS-P, ID# L06 20074299-100R-02				
Pumping	Feed Pump #P-102: 4,430 GPM, 60 HP, 40' head, 1,190 RPM	Filtration room	Flowserve, M# 10MF16-FR6A, S# 0706MS004499-1	Electricity	Process	Approx. 2007	85%
	Feed pump motor, 60 HP, 1,190 RPM, 94.5% efficiency		Emerson, M# 6212-2Z-J, Cat. # D60V3CS-P, ID# L06 20074299-100R-01				
Ventilation	CW-10: Wall-mounted exhaust fan	Scour room	Endustra Filter Mfrs., M# P09RJ-CB5016, S# 122811	Electricity	Blowers	2007	85%
Ventilation	CW-9: Wall-mounted exhaust fan	Scour room	Endustra Filter Mfrs., M# P09RJ-CB5016	Electricity	Blowers	2007	85%
Ventilation	EF-1: Exhaust fan, 2,500 CFM, 1,295 RPM; 0.5 HP, 1,725 RPM motor	Roof	Loren Cook, M# 165 ACRU 165R5B, S# 076S959523-01/0000701	Electricity	Filtration room	2007	85%
Ventilation	Gravity intake cap, 252 CFM	Roof	Loren Cook, M# 80 PR 8 PR, S# 0768959523-01/0007701	Electricity	Filtration room	2007	85%
Ventilation	EF-4: Exhaust fan, 75 CFM, 1,550 RPM; 0.05 HP, 1,550 RPM motor	Roof	Loren Cook, M# 70 ACEM 70C15DM, S# 076S959523-01/0004401	Electricity	Filtration room	2007	85%
Ventilation	EF-2: Exhaust fan, 10,000 CFM, 932 RPM; 1.5 HP, 1,725 RPM	Roof	Loren Cook, M# 300 HXEL 30HXEL8B, S# 076S959523-00/0000701	Electricity	Filtration room	2007	85%
Ventilation	EF-3: Exhaust fan, 10,000 CFM, 932 RPM; 1.5 HP, 1,725 RPM	Roof	Loren Cook, M# 300 HXEL 30HXEL8B, S# 076S959523-00/000702	Electricity	Filtration room	2007	85%
Air Compression	Compressor #C-700: 33.1 CFM, 10 HP, 3,520 RPM	Filtration room	Atlas Copco, Type # GA7, S# API102690	Electricity	Process	2007	85%
Air Compression	Compressor #C-710: 33.1 CFM, 10 HP, 3,520	Filtration room	Atlas Copco, Type # GA7, S# API102688	Electricity	Process	2007	85%

	RPM						
Process	Strainer #115	Filtration room	Fluid Engineering, M# 723, S# 5179	Electricity	Process	Approx. 2007	85%
	Strainer motor, 1/4 HP, 1,725 RPM, 55% efficient		Baldor, Cat. # KL3403, Spec. # 34C63-5506, S# W0611161112				
Process	Strainer #110	Filtration room	Fluid Engineering, M# 723, S# 5178	Electricity	Process	Approx. 2007	85%
	Strainer motor, 1/4 HP, 1,725 RPM, 55% efficient		Baldor, Cat. # KL3403, Spec. # 34C63-5506, S# W0702142062				
Process	Blower #900: Blower, 3,550 RPM	Scour room	Continental Industrie, M# 077A.04, S# 0777A019	Electricity	Process	2007	85%
	Blower motor: 100 HP, 3,560 RPM, 95% efficient		Baldor, M# 16M077W808G1, S# 00705010005				
Process	Blower #910: Blower, 3,550 RPM	Scour room	Continental Industrie, M# 077A.04, S# 0777A018	Electricity	Process	2007	85%
	Blower motor: 100 HP, 3,560 RPM, 95% efficient		Baldor, M# 16M077W808G1, S# 00705010010				

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:

At this time there are no capital improvements recommended by SWA/BSG-PMK.

Category II: Operations & Maintenance:

Due to the age and condition of the building, there are no operations and maintenance recommendations at this time.

Category III Recommendations: Energy Conservation Measures:

Summary Table

ECM #	Description
1	Lighting Upgrades
2	34 kW Roof-Mounted PV System

ECM #1: Lighting Upgrades

Description:

Lighting at Filtration Building primarily consists of energy-efficiency fixtures with T8 lamps and electronic ballasts. There are also a number of Metal Halide fixtures. SWA/BSG-PMK recommends retrofitting the incandescent exit signs with LED technology. 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	$160.00
Rebate	$40.00
Net Cost	$120.00
Savings (kWh)	456
Savings ($)	$45.55
Payback	2.6

Source of cost estimate: Empirical Data

Economics:

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO2 Reduced, lbs/yr
1	Lighting Upgrades	Empirical Data	$160	$40	$120	456	0.04	0	0.13	$0	$46	15	$536	2.63	347%	23%	38%	$424	624

Assumptions:

The electric cost used in this ECM was $0.10/kWh, which was the facilities' average rate for the 12-month period from May, 2009 through April, 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 and installing lighting controls. The total rebate this ECM qualifies for is $40.

ECM #2: 34-kW Roof-Mounted PV System

Description:

Currently, the filtration building does not use any renewable energy systems. Renewable energy systems, such as photovoltaic panels, can be mounted on the roof of the facility and can offset a significant 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. SWA/BSG-PMK presents below the economics of installing a 34-kW PV system to offset electrical demand for the building and reduce the annual net electric consumption for the building. A system of 225 commercial multi-crystalline 230 watt panels would generate 47,644 kWh of electricity per year, or 1% of the filtration building's annual electric consumption.

Installation cost:

Estimated installed cost: $315,000; SREC revenue included in "Total 1st Year Savings"
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	34 kW Roof-Mounted PV	Similar Projects	$315,000	$45,000	$270,000	47,644	4.32	0	13.55	$0	$28,098	30	$536,764	9.61	99%	3%	10%	$280,733	65,272

Assumptions:

Cost of installation was estimated, using data from similar projects, at approximately $7,000 per kW. Annual energy savings were calculated via "PV Watts", an online tool on the website of the National Renewable Energy Laboratory.

Rebates/financial incentives:

This ECM is eligible for New Jersey's Solar Renewable Energy Certificates (SREC). SRECs are marketable certificates issued to the owner of a PV system for each 1,000 kWh (1MWh) of electricity generated. SRECs are sold or traded separately from the power generated; the income from the sale of the SREC can be used to offset the cost of the system by applying the revenue to a loan payment or debt service. The value of the SREC is market driven, and is controlled by the amount of the Solar Alternative Compliance Payment (SACP) which is set by the NJBPU. The SREC market is derived from New Jersey's Renewable Portfolio Standard (RPS), which requires that all licensed energy suppliers in the state invest in energy generated from renewable sources, with specific requirements for solar power. If a supplier does not invest by purchasing SRECs, the supplier must pay the SACP for a percentage of the total annual power produced. Since SRECs typically trade just below the SACP, there is an incentive for the supplier to buy SRECs. The SREC Program provides a

market for SRECs to be created and verified on the owner's behalf. The New Jersey Clean Energy program facilitates the sale of SRECs to New Jersey electric suppliers. PV system owners in New Jersey with a grid-connected PV system are eligible to participate in New Jersey's SREC Program.

The NJBPU has stated its intention to continue to operate a program of rebates and SRECs, On September 12, 2007, the NJBPU approved an SREC only pilot incentive program. The program set the SACP at an initial value of $711, decreasing annually for an eight (8) year period. SRECs would be generated for fifteen (15) years (referred to as the Qualification Life), and have a two (2) year trading life. The NJBPU believes that to achieve an internal rate of return of twelve (12) percent, the target SREC price would be $611, reducing by three (3) percent per year for the same eight (8) year period that the SACP is set.

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

As a result of our study, the roof of the New Brunswick Filtration Building has been identified as conducive for the application of a Photovoltaic (PV) system.

Based on the goal of generating as much of the building's electric load as possible utilizing renewable energy while meeting the limitations of usable space available, a PV system with a design capacity of 34 kW was selected. The total annual generating capacity of the system is 47,644. as estimated using PV WATTS calculator provided by the Department of Energy (DOE), National Renewable Energy Laboratory (NREL).

Station Identification	
City:	Newark
State:	New_Jersey
Latitude:	40.70° N
Longitude:	74.17° W
Elevation:	9 m
PV System Specifications	
DC Rating:	45.0 kW
DC to AC Derate Factor:	0.770
AC Rating:	34.6 kW
Array Type:	Fixed Tilt
Array Tilt:	7.5°
Array Azimuth:	219.5°
Energy Specifications	
Cost of Electricity:	10.0 ¢/kWh

Results			
Month	Solar Radiation ($kWh/m^2/day$)	AC Energy (kWh)	Energy Value ($)
1	2.22	2322	232.20
2	2.98	2905	290.50
3	3.92	4166	416.60
4	4.74	4730	473.00
5	5.65	5686	568.60
6	5.91	5572	557.20
7	5.74	5533	553.30
8	5.30	5059	505.90
9	4.50	4282	428.20
10	3.42	3411	341.10
11	2.17	2114	211.40
12	1.85	1866	186.60
Year	4.04	47644	4764.40

This proposed PV system would include 225 flat, crystalline PV modules installed on the roof. The system is based on commonly used 200 Watt PV modules, and one (1) inverter for conversion to AC power.

The proposed system would generate approximately 1 percent of the electric power consumed annually by the New Brunswick Filtration Building. It is noted this system would supplement the utility power supply since PV electricity production is based on weather and the system size is limited to 1 percent. The estimated cost of construction would be approximately $315,000 for this system. The approximate annual savings would be $28,098, which would make the approximate payback 11 years

PV System – New Brunswick Water Utility Filtration Bldg		
	Savings	**Cost**
Estimated Cost Of Construction		$315,000
REIP Incentive		-$45,000
Township Investment		$270,000
First Year Electric Energy Savings	$4,766	
Estimated Annual SREC Revenue	$23,832	
Annual Maintenance		$500
First Year Savings	$28,098	
Simple Payback Analysis	Approximately 11 Years	

If the Client is interested in moving forward, a structural analysis of the roofs must be performed to confirm they will support the addition of PV modules.

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.

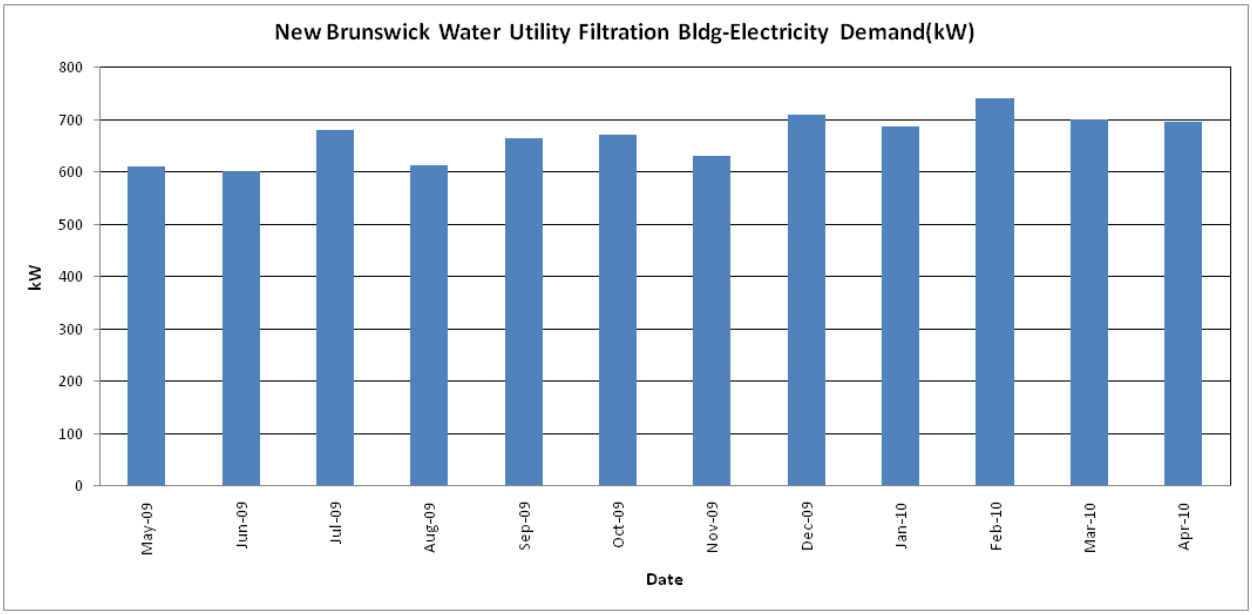
6.6. Wind

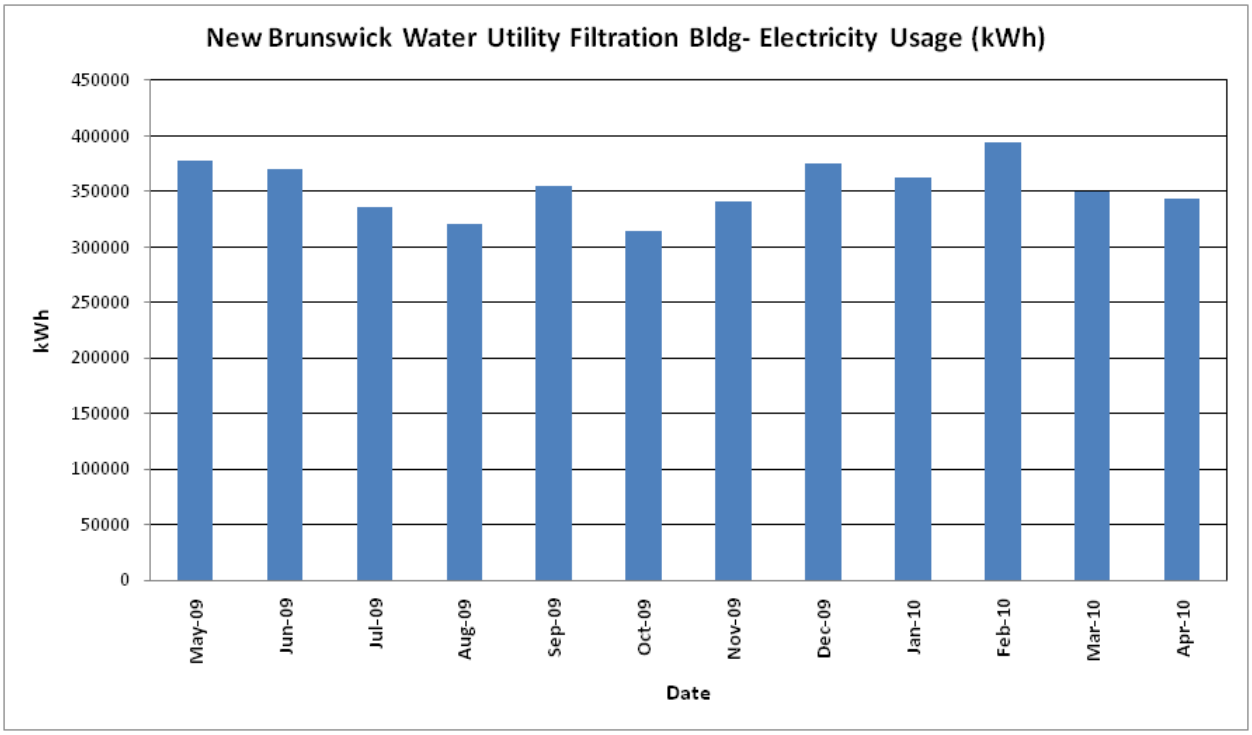
Wind power production is not appropriate for this location because required land is not available for the wind turbine. Also, the available wind energy resource is very low.

7. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

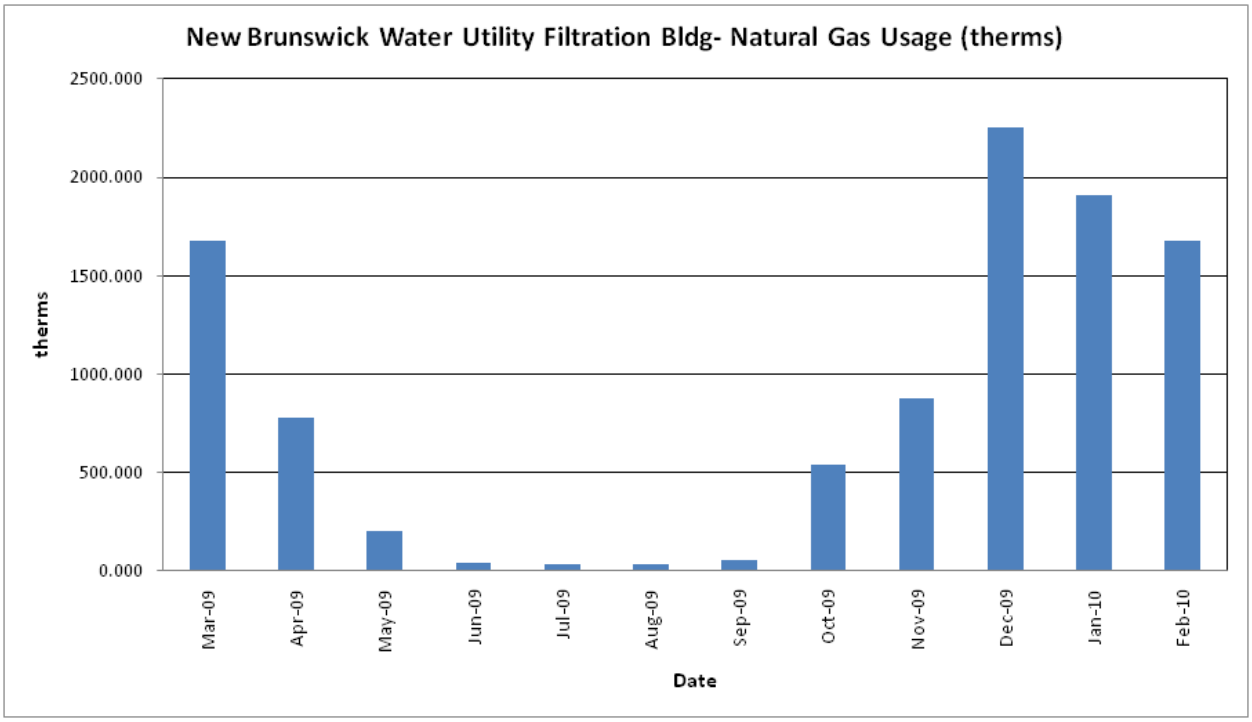
7.1. Energy Purchasing

The average electrical peak demand for the previous year was 667 kW and the maximum peak demand was 740 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.



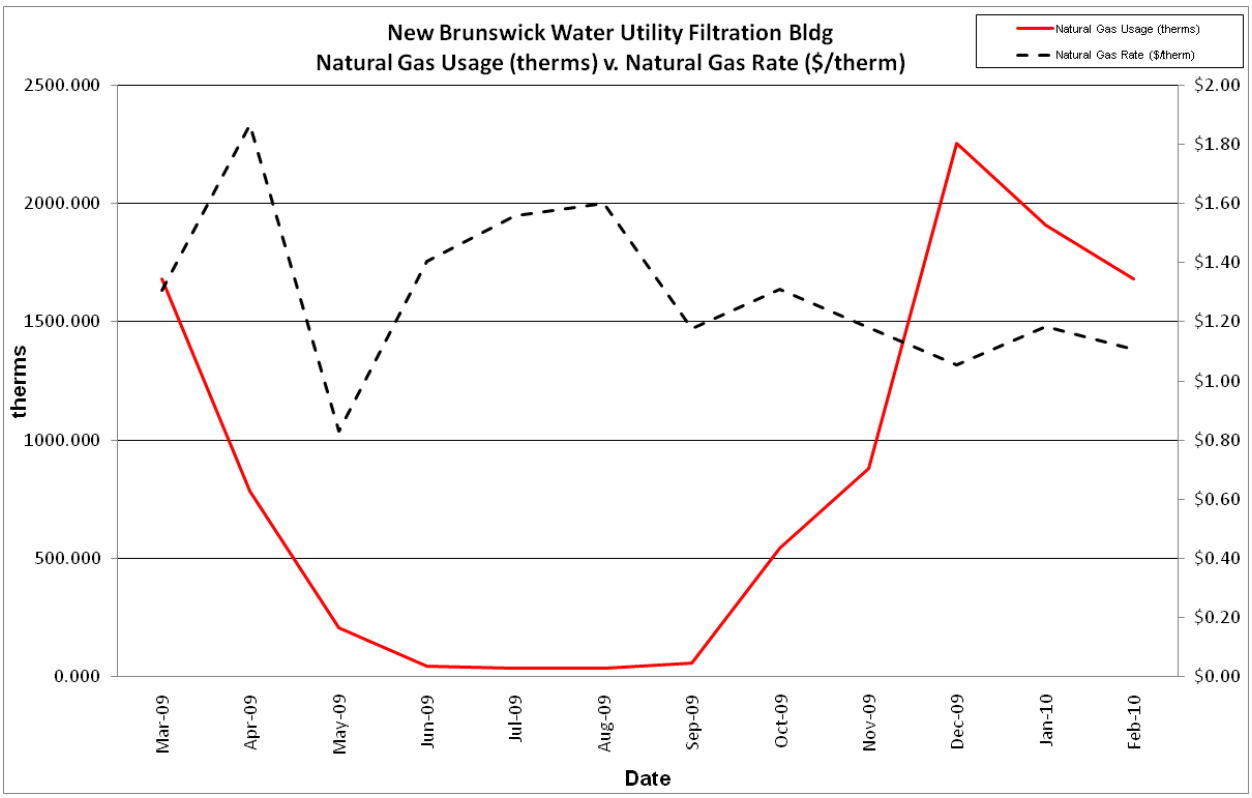
The natural gas usage shows that the most natural gas is consumed in the winter months, meaning the majority of natural gas use in this building is for heating.

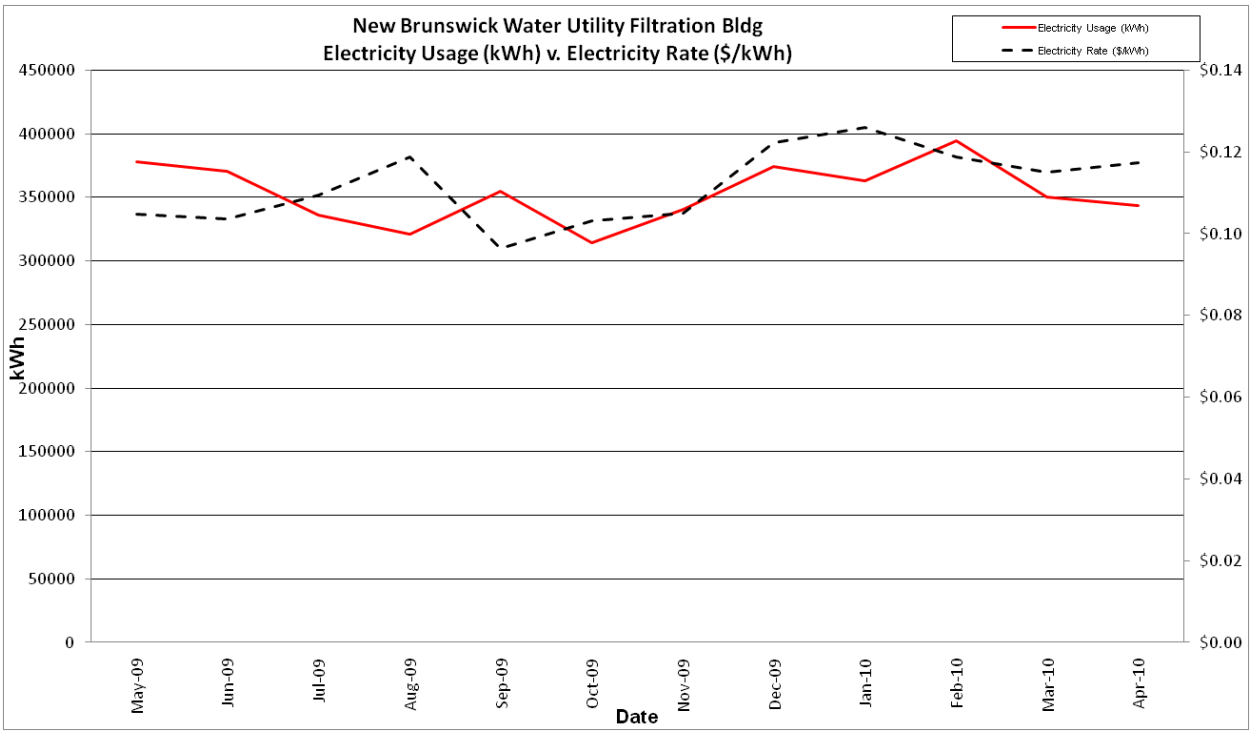
7.2. Tariff analysis

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 New Brunswick Filtration Building 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 New Brunswick Filtration Building is direct-metered (via one meter) and currently purchases electricity transmission from Public Service Electric & Gas and electricity supply from Direct Energy at a general service rate. The general service rate for electric charges are market-rate based on use and the New Brunswick Filtration Building 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.

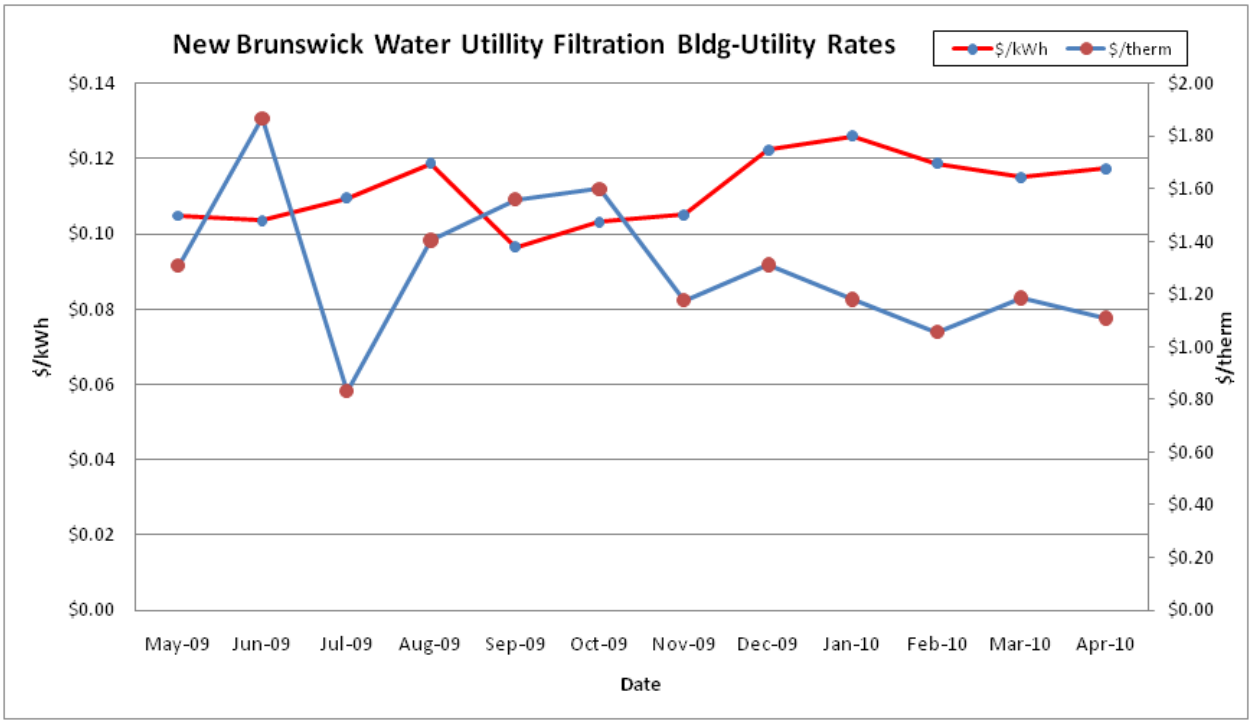

New Brunswick Water Utility Filtration Bldg
Natural Gas Usage (therms) v. Natural Gas Rate ($/therm)
Natural Gas Usage (therms)
Natural Gas Rate ($/therm)
2500.000
2000.000
1500.000
1000.000
500.000
0.000
therms
$2.00
$1.80
$1.60
$1.40
$1.20
$1.00
$0.80
$0.60
$0.40
$0.20
$0.00
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Date


New Brunswick Water Utility Filtration Bldg
Electricity Usage (kWh) v. Electricity Rate ($/kWh)
Electricity Usage (kWh)
Electricity Rate ($/kWh)
450000
400000
350000
300000
250000
200000
150000
100000
50000
0
kWh
$0.14
$0.12
$0.10
$0.08
$0.06
$0.04
$0.02
$0.00
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Apr-10
Date

7.3. Energy Procurement strategies

Billing analysis shows large price fluctuations of over the course of the year for the New Brunswick Filtration Building 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.

New Brunswick Water Utility already purchases electricity from a third party supplier at a rate lower than the state average. Natural gas is purchased for less than the state average from PSE&G.



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 Brunswick
Water Utility Filtration Building
1 Comstock Street

BIRDSALL SERVICES GROUP
ENGINEERS & CONSULTANTS

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	2x2 fixture with (2) T8 U-Tube Lamps and an Electronic Ballast / No Upgrade	2L22"	62	No Upgrade	62	17	$0.00	$0.00
2	4' wrap around fixture w/ (3) T8 Lamps and Electronic Ballast / No Upgrade	3L4' T8/ELEC	89	No Upgrade	89	9	$0.00	$0.00
3	4' wall pack fixture with (2) T8 Lamps and Electronic Ballast / No Upgrade	2L4' T8/ELEC	61	No Upgrade	61	1	$0.00	$0.00
4	250W Metal Halide High-Bay Fixture / No Upgrade	250W MH/BALLAST	286	No Upgrade	286	19	$0.00	$0.00
5	4' wall pack fixture with (2) T8 Lamps and Electronic Ballast / No Upgrade	2L4' T8/ELEC	61	No Upgrade	61	34	$0.00	$0.00
6	Exterior wall pack 250W Metal Halide Fixture / No upgrade	250W MH/BALLAST	286	No Upgrade	286	16	$0.00	$0.00
7	Replace 15W incandescent exit signs w/ 2W LED exit signs	15W EXIT	15	LED	2	4	$40.00	$10.00
8						0	$0.00	$0.00
9						0	$0.00	$0.00
10						0	$0.00	$0.00
11						0	$0.00	$0.00
12						0	$0.00	$0.00

Summary

	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
Cost	$160.00	$0.00	$160.00
Rebate	$40.00	$0.00	$40.00
Net Cost	$120.00	$0.00	**$120.00**
Savings (kWh)	456	0	**456**
Savings ($)	$45.55	$0.00	**$45.55**
Payback	2.6		**2.6**

Variables:

$0.10	Avg. Electric Rate ($/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:					14060				14008	0.052	456	$160.00	$45.55	3.5			0	$0.00	$0.00		$40.00	$0.00	456	$120.00	$45.55	2.6
1	1	Office lobby	8	2080	2L22"	9	558		No Upgrade	9	558	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
2	1	Restroom	8	2080	2L22"	2	124		No Upgrade	2	124	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
3	1	Office	8	2080	2L22"	3	186		No Upgrade	3	186	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
4	1	Office	8	2080	2L22"	3	186		No Upgrade	3	186	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
5	2	Electrical room	8	2080	3L4' T8/ELEC	9	801		No Upgrade	9	801	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
6	3	Stairwell	8	2080	2L4' T8/ELEC	1	61		No Upgrade	1	61	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
7	5	Filtration room	8	2080	2L4' T8/ELEC	12	732		No Upgrade	12	732	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
8	4	Filtration room	8	2080	250W MH/BALLA	19	5434		No Upgrade	19	5434	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
9	5	Scour room	8	2080	2L4' T8/ELEC	6	366		No Upgrade	6	366	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
10	5	Sodium hydroxide/citric acid room	8	2080	2L4' T8/ELEC	10	610		No Upgrade	10	610	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
11	5	Sodium hypochlorite room	8	2080	2L4' T8/ELEC	6	366		No Upgrade	6	366	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
12	6	External	8	2080	250W MH/BALLA	16	4576		No Upgrade	16	4576	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
13	7	Exit signs	24	8760	15W EXIT	4	60		LED	4	8	0.052	456	$160.00	$45.55	3.5			0	$0.00	$0.00		$40.00	$0.00	456	$120.00	$45.55	2.6

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**

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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.