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June 22, 2010

Local Government Energy Program
Energy Audit Report

For

Beachwood Community Center

147 Compass Ave, Beachwood, NJ 08722

Project Number: LGEA39

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INTRODUCTION

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 the additional 25% will also be paid by the program. The Board of Public Utilities (BPU) Office of Clean Energy has assigned TRC Energy Services to administer the Program.

On November 13, 2009, Steven Winter Associates, Inc. (SWA) and PMK Group, Inc., a business unit of Birdsall Services Group (BSG-PMK), performed an energy audit and assessment for the Beachwood Community Center. The building is located at 147 Compass Ave, Beachwood, New Jersey 08722, in Ocean County. 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 one-story facility was built in 1985 and is 4,500 square feet. The building is used as a meeting space for community members and organizations and operates 40-50 hours a week.

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

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

EXECUTIVE SUMMARY

This document contains the energy audit report for the Beachwood Community Center, located at 147 Compass Avenue, Beachwood, New Jersey 08722.

Based on the field visit performed by SWA and BSG-PMK staff on November 13, 2009 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, October, 2008 through September, 2009, the Facility consumed a total of 46,283 kWh of electricity for a total cost of $8,099 and 3,044 therms of natural gas, for a total cost of $4,186.86.

With electricity and fossil fuel combined, the building consumed 462 MMBtus of energy at a total cost of $12,285.86.

BSG-PMK has entered energy information about the Facility in the US Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* energy benchmarking system. In order to compare commercial buildings equitably, the *Portfolio Manager* ratings convey the consumption of each type of energy in a single common unit. The EPA uses source energy to represent the total amount of raw fuel required to operate the building. The site energy use intensity for the complex is 103.0 kBtu/sq.ft/year. After energy efficiency improvements are made, future utility bills can be added to the Portfolio Manager and the site energy use intensity for a different time period can be compared to the year 2009 baseline to track the changes in energy consumption associated with the energy improvements.

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). BSG-PMK encourages the Borough of Beachwood to continue entering utility data in *Energy Star Portfolio Manager* in order to track whether normalized source energy use over time. The building performance rating could not be determined because this is a mixed-use facility, comprised by non-eligible space types categorized as "Other".

(Refer to Section 1.3 for Energy Star Rating)

Category I Recommendations: Capital Improvement Measures

Based on the results of BSG-PMK and SWA's survey, no capital improvement measures are recommended.

Category II Recommendations: Operations and Maintenance

- Verify and coordinate with Advanced Building Controls on occupied and night setback temperatures.
- Install life safety energy-efficient light-emitting diodes (LEDs) emergency exit signs.

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

At this time, BSG-PMK and SWA highly recommend a total of **1** Energy Conservation Measure (ECM) for the Facility that is summarized in the following Table 1. The total investment cost for this ECM is **$2,973**. SWA and BSG-PMK estimate a first year savings of **$1,401** with a simple payback of **2.1 years**. SWA and BSG-PMK estimate that implementing the highly recommended ECMs will reduce the carbon footprint of the High School building by **10,967 lbs of CO_2**, which is equivalent to removing approximately one car from the roads each year.

There are various incentives that the Borough of Beachwood could apply for that could also help lower the cost of installing the ECMs. BSG-PMK and SWA recommend that the Borough apply for the NJ SmartStart program through the New Jersey Office of Clean Energy. This incentive can help provide technical assistance for the building in the implementation phase of any energy conservation project. A new NJ Clean Power program, Direct Install, could also assist to cover up to 80% of the capital investment. In order to qualify, the facility being upgraded must not have had a peak demand that exceeded 200 kW in any of the preceding 12 months; the highest peak demand for the complex in the previous year was 21.4 kW.

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

Table 1 - Highly Recommended 0-5 Year Payback ECMs																			
ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings, $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO_2 Reduced, lbs/yr
1	Lighting Upgrade	Similar Projects	$3,708	$0	$3,708	8,005	3.5	0	6.07	$0.00	$1,401	15	$16,484	2.65	345%	23%	37%	$13,016	10,967
TOTAL			$3,708	$0	$3,708	8,005	3.5	0	6.07	$0.00	$1,401	-	$16,484	2.65	-	-	-	$13,016	10,967

ROI: Return on Investment (%)

Assumptions:

Discount rate: 3.2% per DOE FEMP guidelines

Energy price escalation rate: 0% per DOE FEMP guidelines

Electricity rate: $0.1750 $/kWh

Gas rate: $0.5738 $/therm

Area of Building (SF) 4,500

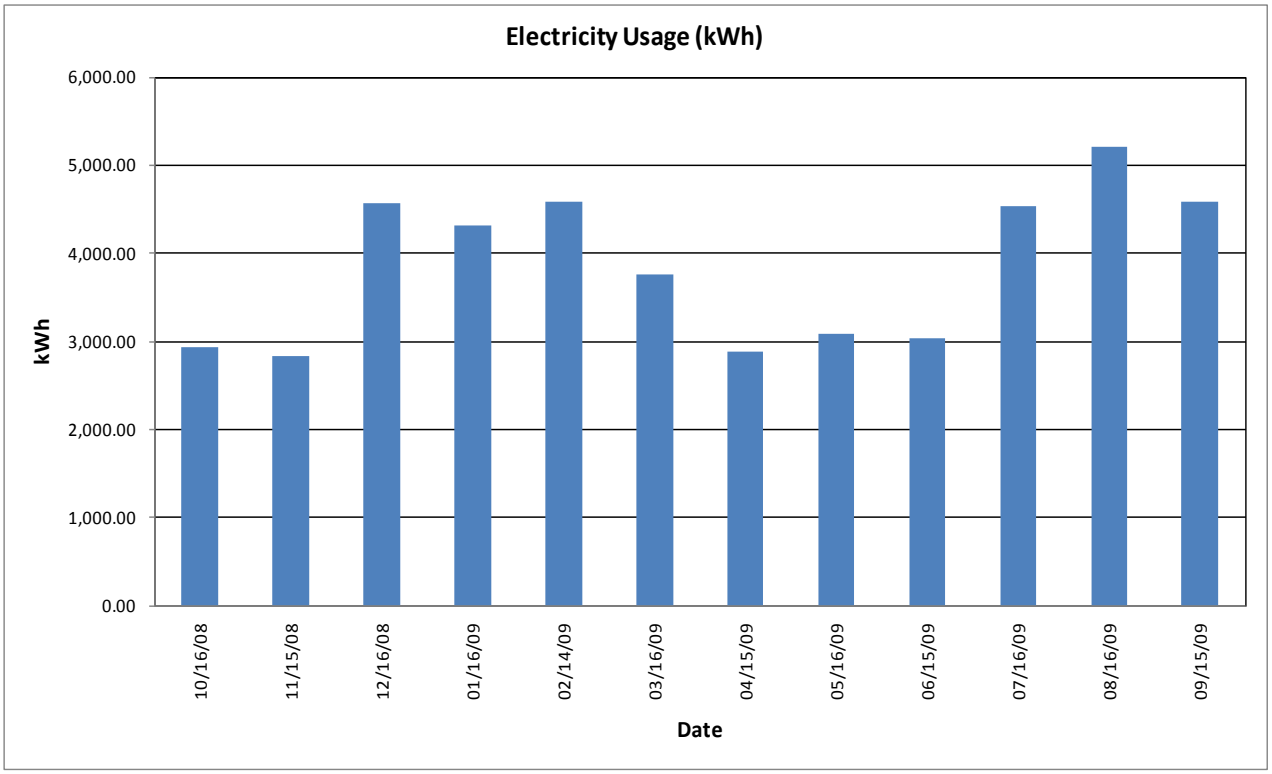
1. HISTORIC ENERGY CONSUMPTION

1.1 ENERGY USAGE AND COST ANALYSIS

BSG-PMK analyzed utility bills from October, 2008 through September, 2009 that were received from the utility companies supplying the Facility with electric and natural gas. The costs per therm from the third party supplier for natural gas were calculated for some months based on previous months' averages.

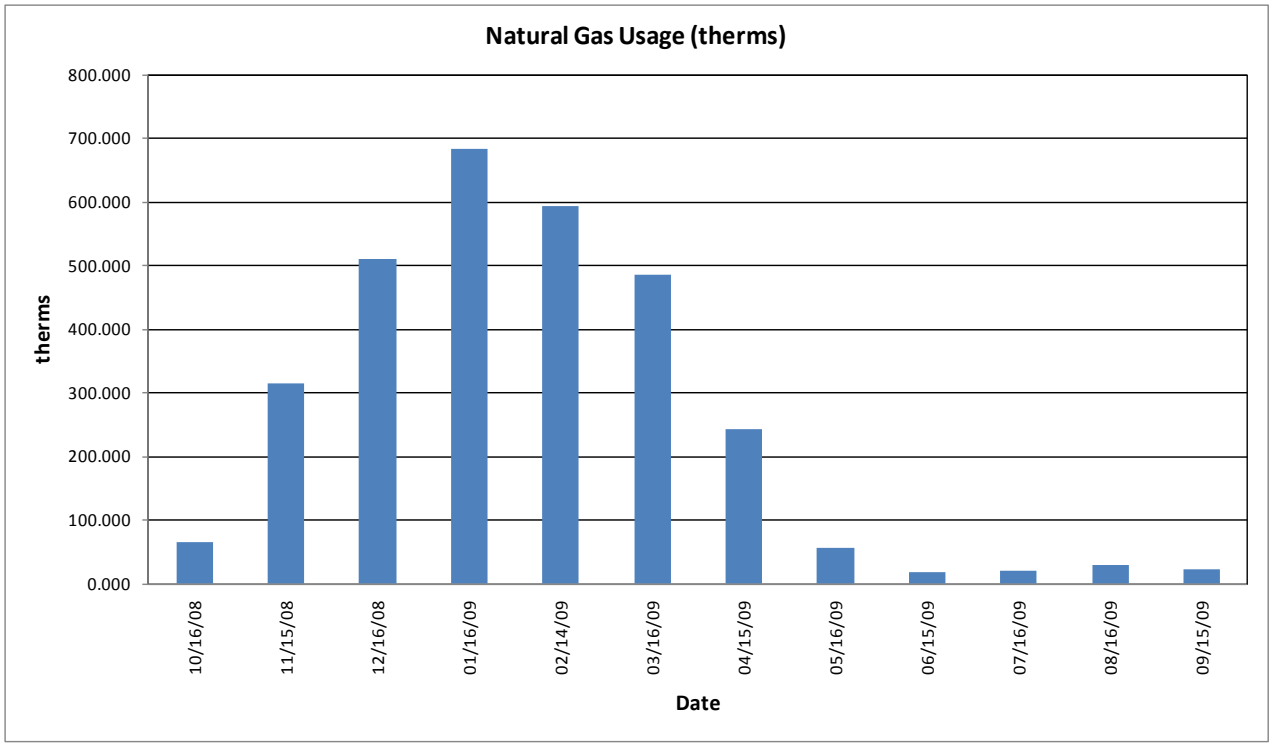
Electricity - The Facility is currently served by one electric meter and buys electricity from Jersey Central Power & Light at **an average rate of $0.17/kWh** based on 12 months of utility bills from October, 2008 through September, 2009. The building purchased **46,283 kWh or $8,099.43 worth of electricity** during that time span.

The following chart shows electricity usage for the building based on utility bills from October, 2008 through September, 2009:



Natural Gas - The Facility is currently served by one natural gas meter and buys gas from New Jersey Natural Gas at **an average rate of $1.38/therm** based on 12 months of utility bills from October, 2008 through September, 2009. The unit cost is fairly low, due to minimal gas consumption from May through September. The building purchased **3,045 therms or $4,186.86 worth of natural gas** during that time span. The costs per therm from the third party supplier for natural gas were calculated for some months based on previous months' averages

The following chart shows the natural gas consumption for the complex based on natural gas bills for the 12 month period of October, 2008 through September, 2009:



1.2 UTILITY RATE

The Facility currently purchases electricity from Jersey Central Power & Light for electricity use (kWh) with a separate (kW) demand charge. The complex currently pays an average rate of approximately $0.17/kWh based on the 12 months of utility bills of October, 2008 through September, 2009.

The Facility currently purchases natural gas transmission from New Jersey Natural Gas and natural gas supply from Pepco at an average aggregated rate of $1.38/therm based on 12 months of utility bills from October, 2008 through September, 2009. The costs per therm from the third party supplier for natural gas were calculated for some months based on previous months' averages

1.3 ENERGY BENCHMARKING

The building information and utility data were entered into the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. SWA recommends that the Borough maintain the Portfolio Manager account at the link below. As the account is maintained, SWA can share with the Borough and allow future data to be added and tracked using the benchmarking tool.

http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

[redacted]

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). BSG-PMK encourages the Borough to continue entering utility data in Energy Star Portfolio Manager in order to track whether normalized source energy use over time.

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Community Center

Building ID: 2006320
For 12-month Period Ending: September 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: January 25, 2010

Facility
Community Center
147 Compass Ave
Beachwood, NJ 08722

Facility Owner
Borough of Beachwood
1600 Pinewald Rd
Beachwood, NJ 08722

Primary Contact for this Facility
Elizabeth Mastropasqua
1600 Pinewald Rd
Beachwood, NJ 08722

Year Built: 1985
Gross Floor Area (ft²): 4,500

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

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	157,918
Natural Gas (kBtu)[4]	304,459
Total Energy (kBtu)	462,377

Energy Intensity[5]	
Site (kBtu/ft²/yr)	103
Source (kBtu/ft²/yr)	188

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	40

Electric Distribution Utility
FirstEnergy - Jersey Central Power & Lt Co

National Average Comparison	
National Average Site EUI	52
National Average Source EUI	102
% Difference from National Average Source EUI	84%
Building Type	Social/Meeting

Stamp of Certifying Professional

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

Meets Industry Standards[6] **for Indoor Environmental Conditions:**

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

Certifying Professional
N/A

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

The government estimates the average time needed to fill out this form is 6 hours (includes the time for entering energy data, PE facility inspection, and notarizing the SEP) and welcomes suggestions for reducing this level of effort. Send comments (referencing OMB control number) to the Director, Collection Strategies Division, U.S., EPA (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460.

EPA Form 5900-16

The Site Energy Use Intensity is 103 kBtu/ft^{2}yr compared to the national average of 90 kBtu/ft^{2}yr for commercial buildings classified by the Energy Star Portfolio Manager as "Other". Implementing this report's recommendations will reduce use by approximately 6.1 kBtu/ft^{2}yr, which when implemented would lower the buildings energy consumption.

2. FACILITY AND SYSTEMS DESCRIPTION

2.1 BUILDING ENVELOPE

2.1.1 Exterior Walls

The exterior wall envelope of the Community Center is comprised of exterior grade T-111 paneling. The interior walls are finished with insulation and gypsum wall board. There were no signs of damage or cracks in the wall. The exterior paint protects the walls from the salt in the air and maintains the building in good condition.

2.1.2 Roof

The Community Center has a pitched roof covered with asphalt shingles. No water damage or drainage issues are evident. The roof, vinyl soffit and flashings were found to be in good condition.

2.1.3 Base

The Community Center building's base is elevated on pilings because of the sandy soil and proximity to the water's edge. There is a gap under the building between the floor and the soil.

2.1.4 Windows

There are (8 qty.) 36"x40", (7 qty.) 44"x40" and (2 qty.) 1'x2' windows. All are aluminum framed double pane windows. No infiltration issues are evident.

Double Pane Aluminum Framed Windows

2.1.5 Exterior doors

There are eight painted metal doors 1 5/8" thick. These doors could use some new weather stripping because of the corrosiveness of the salt air.

2.1.6 Building air tightness

The building was inspected and it was determined that the building air tightness was fair. There were no complaints of drafts or cold spots, or indications of occupant discomfort.

2.2 HVAC Systems

2.2.1 Heating

Heating is provided by three Rheem Classic Quiet 80 gas-fired furnaces. They are 80% efficient and were installed two years ago. The furnaces are equipped with cooling coils, and act as air-handlers for the cooling system. Temperature is controlled by Advanced Building Controls system.

2.2.2 Cooling

Cooling is provided by three Rheem Corsaire Series condensing units. One is a 48,000 Btu unit, model # 14AJA48A01 with a Seasonal Energy Efficiency Ratio (SEER) of 14. The other two are 60,000Btu units, model # 14AJA60A01 with a SEER of 14. All three units were installed two years ago. The three units feed the cooling coils, located in the furnaces in the mechanical room. Temperature is controlled by the Advanced Building Controls building automation system.

2.2.3 Ventilation

An exhaust fan on the roof provides ventilation for the mechanical room, and a wall-mounted exhaust fan provides ventilation for the kitchen. The exhaust fans were found to be in fair condition.

2.2.4 Domestic Hot Water

Water is heated by a gas-fired 40-gallon Whirlpool water heater, located in the mechanical room. The unit has a heating capacity of 34 MBH, a recovery of 28.8 GPH, and was installed two years ago.

2.3 Electrical systems

2.3.5 Lighting

A complete inventory of all interior, exterior, and exit sign light fixtures were examined and documented in Appendix A of this report including an estimated total lighting power consumption. Our initial findings

indicate that performing a detailed lighting upgrade per the recommendations in Appendix A will result in an annual savings of $ 1,400.90 based on the current $0.17/kWh and the current occupancy schedule. Implementation of this ECM will cost approximately $3,782. Currently the Board of Public Utilities (BPU) would offer an estimated Rebate of $735 yielding a net cost of $3,047 for this project. With a yearly savings of $1,400.90 the payback on this ECM would be just about 2.2 years.

The facility is lit primarily by T-12 fixtures with magnetic ballasts. There are also many 60- and 100-watt incandescent lamps lighting various areas. There are no exit signs. There are no occupancy sensors in the facility.

Category I Recommendations: Operations & Maintenance #3 – Install emergency exit signs according to code. Select energy-efficient light-emitting diode (LED) fixtures to avoid the higher operating costs of alternate fixtures.

Category III Recommendation: ECM #1 – Retrofit all T-12 fixtures with energy efficient T-8 lamps & electronic ballasts and replace all incandescent lamps with compact fluorescents.

Lighting inventory w/recommended lighting upgrades are detailed in Appendix A.

2.3.6 Appliances and process

The facility contains a kitchen for use during events. In the kitchen there is; one ice maker, one horizontal freezer, one refrigerator, one gas stove, one microwave, and two coffee makers. There are no computers at this facility.

2.3.7 Elevators

There are no elevators in the facility.

2.3.8 Other electrical systems

There are no other major electrical systems in the building.

3 EQUIPMENT LIST

Building System	Description	Location	Model #	Fuel	Space Served	Year Installed	Estimated Remaining Useful Life %
Heating/ Cooling	3 gas-fired furnaces w/ cooling coils; 80% efficient	Mechanical room	Rheem Classic Quiet 80 (no nameplate)	Natural Gas	Entire building	2008	92%
Domestic Hot Water	Water heater; 40 gallons, 34 MBH, 28.8 GPH	Mechanical room	Whirlpool M# BFG1F4034T3NOV	Natural Gas	Entire building	2008	85%
Cooling	4-ton condensing unit; 14 SEER	Outside building	Rheem Corsaire Series M# 14AJA48A01	Electric	Unknown (HVAC serviced/controlled by 3rd party)	2008	87%
Cooling	5-ton condensing unit; 14 SEER	Outside building	Rheem Corsaire Series M# 14AJA60A01	Electric	Unknown (HVAC serviced/controlled by 3rd party)	2008	87%
Cooling	5-ton condensing unit; 14 SEER	Outside building	Rheem Corsaire Series M# 14AJA60A01	Electric	Unknown (HVAC serviced/controlled by 3rd party)	2008	87%
Vent.	Exhaust fan	Roof	Unknown (no roof access)	Electric	Mechanical Room	1985	10%
Vent.	Wall-mounted exhaust fan	Kitchen wall	No nameplate	Electric	Kitchen	1985	10%

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 the Beachwood Community Center, BSG-PMK 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 Improvement Measures

Based on the results of BSG-PMK's survey, no capital improvement measures are recommended.

Category II Recommendations: Operations and Maintenance

1) Pay close attention to set-up and set-back temperatures and issue instructions to Advanced Building Controls to lower set-back and raise set-up temperatures.
2) Install energy-efficient light-emitting diode (LED) emergency exit signs.

Category III Recommendations: Energy Conservation Measures

Summary table

ECM #	Description
1	Lighting Upgrade

ECM#1: Lighting Upgrade

Description:

Lighting at the Beachwood Community Center consists primarily of T-12 fluorescent lamps with magnetic ballasts. It is recommended that all T-12 fixtures with magnetic ballasts be retrofit with T-8 lamps and electronic ballasts. Lighting replacement generally yields a very good payback, due to the fact that lighting usage in commercial buildings is fairly high and the installation is relatively inexpensive.

Also in the buildings are 60- and 100-watt incandescent lamps. It is recommended that these be replaced with compact fluorescents. Only a 26-watt compact fluorescent is needed to produce quantities of light equivalent to that of a 100-watt incandescent, for a 74% reduction in required energy.

Recommended lighting upgrades are detailed in Appendix A.

Installation cost:

Estimated installed cost:	Lighting: $3,782
Rebates/incentives:	Lighting: $735
Net cost, with incentives:	**Total: $3,047**
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, $	CO_2 Reduced, lbs/yr
1	Lighting Upgrade	Similar Projects	$3,708	$735	$2,973	8,005	3.5	0	6.07	$0.00	$1,401	15	$16,484	2.12	454%	30%	47%	$13,751	10,967

Assumptions:

The electric cost used in this ECM was $0.17/kWh, which is the average rate for the 12-month period ranging from October 1, 2008 through September 30, 2009. The replacements for each lighting fixture, the costs to replace or retrofit each one, and the rebates and wattages for each fixture are located in Appendix A.

Rebates/financial incentives:

The New Jersey SmartStart rebate for upgrading lighting fixtures to LED exit signs and T-8 lamps ranges from $10 to $20 per fixture. The total rebate this ECM qualifies for is $735.

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

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.

5 RENEWABLE AND DISTRIBUTED ENERGY MEASURES

5.1 Existing systems

There are currently no existing renewable energy systems.

5.2 Solar Photovoltaic

A small Photovoltaic (PV) system was considered for the roof of the Community Center. There is unobstructed south eastern exposure which allows for adequate sunlight throughout the day. Due to the building's alignment and the four sided pitched roof, the system would require more costly equipment and, in combination with the small size of the system there would not be enough savings to be cost effective.

5.3 Solar Thermal Collectors

Solar thermal collectors are not cost effective for this project and are not recommended due to the low amount of domestic hot water use throughout the building.

5.4 Combined Heat and Power

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

5.5 Geothermal

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

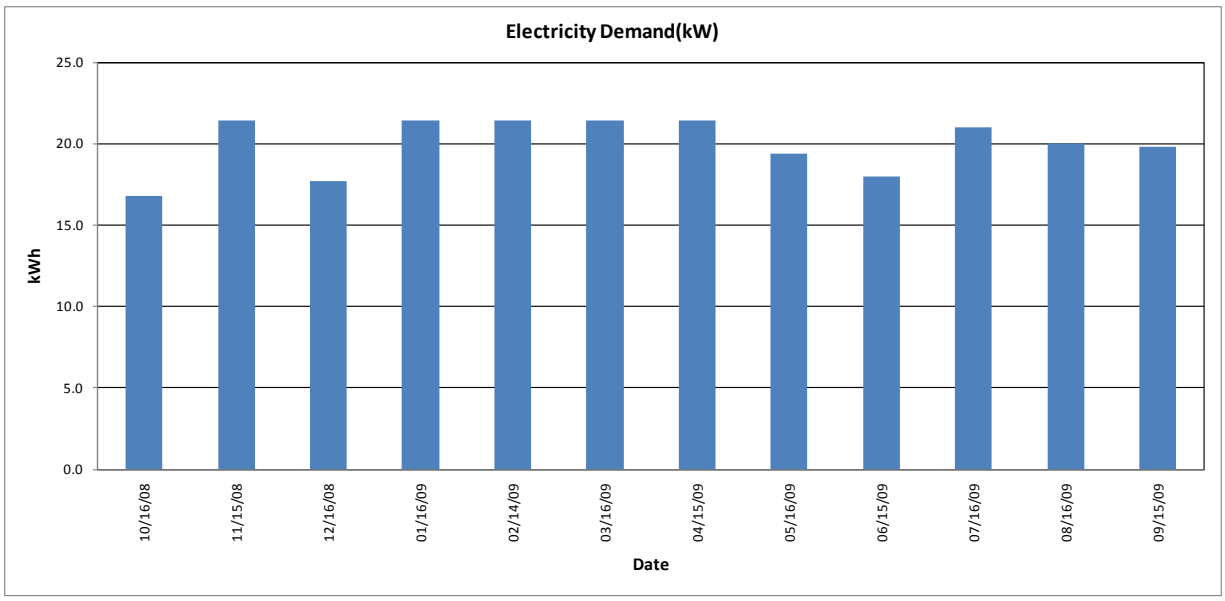
5.6 Wind

Wind power production is not appropriate for this location because required land is not available for the wind turbine. .

6 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

6.1 Load profiles

The average electrical peak demand for the Facility during previous year was 20.0 kW and the maximum peak demand was 21.4 kW. The electric and gas load profiles for this project are presented in the following charts. The first chart shows the electric demand (in kW) for the previous 12 months and the other two charts show electric (in kWh) and gas usage (in therms), respectively.


Electricity Demand(kW)
25.0
20.0
15.0
10.0
5.0
0.0
kWh
10/16/08
11/15/08
12/16/08
01/16/09
02/14/09
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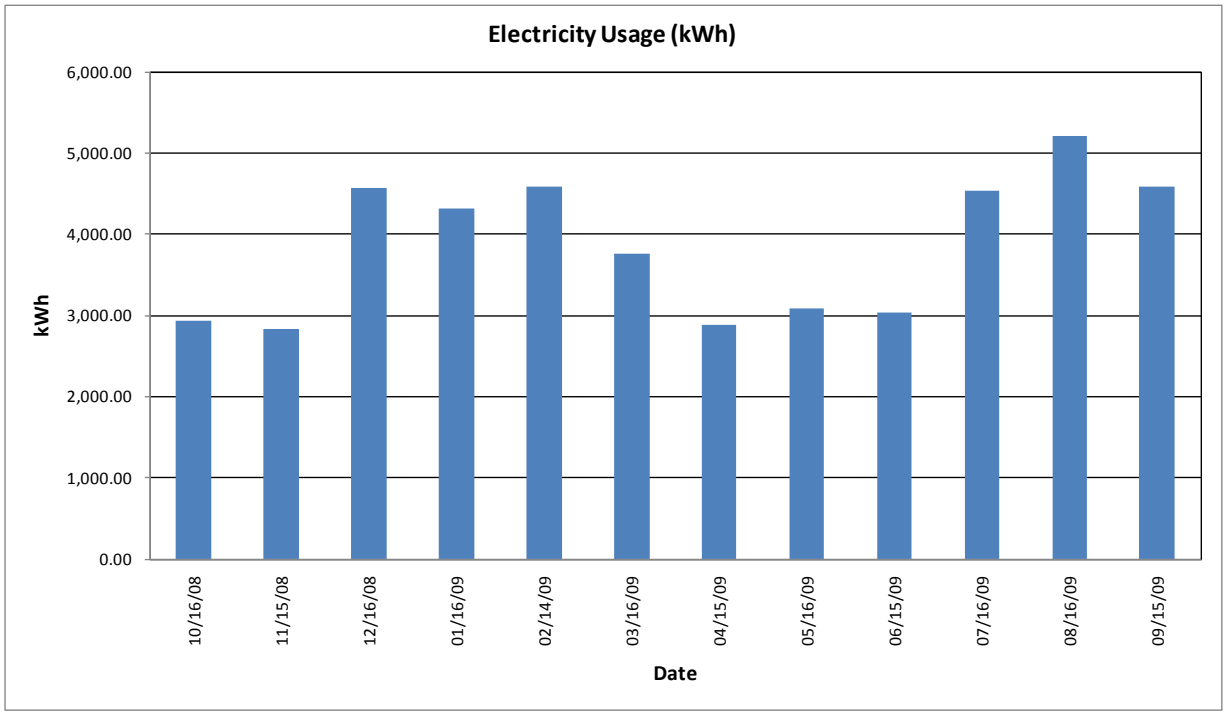
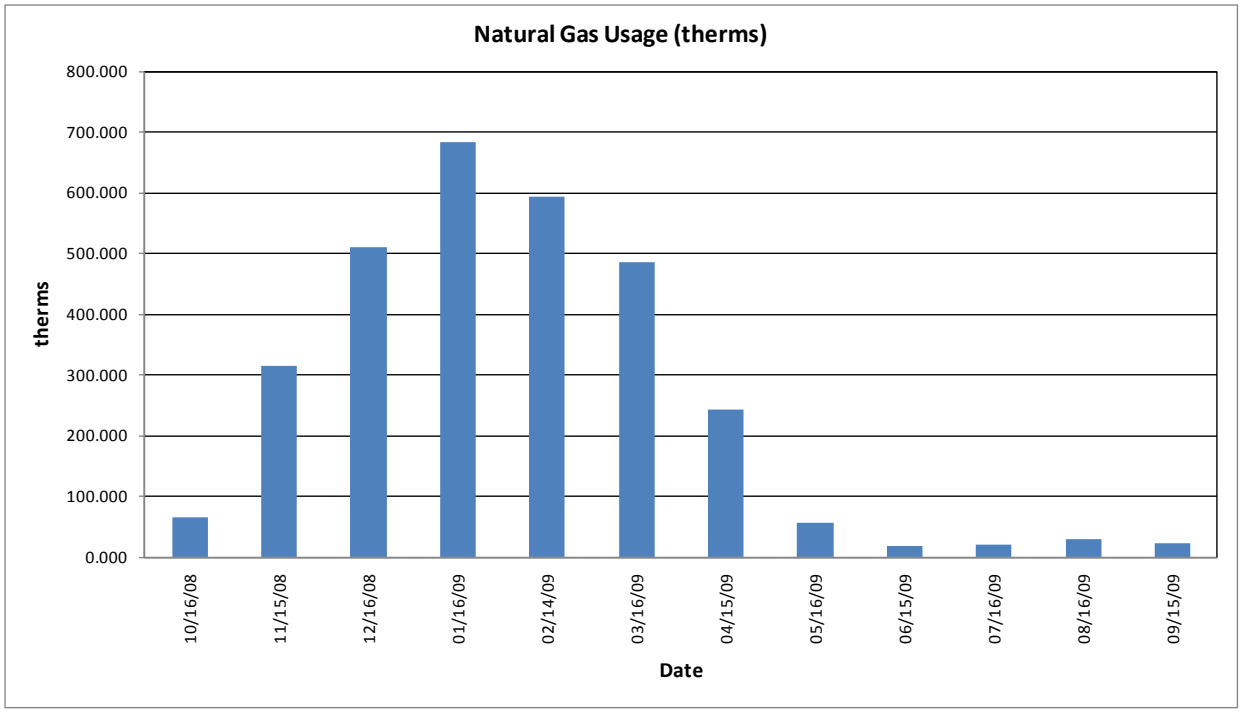
09/15/09
Date


Electricity Usage (kWh)
6,000.00
5,000.00
4,000.00
3,000.00
2,000.00
1,000.00
0.00
kWh
10/16/08
11/15/08
12/16/08
01/16/09
02/14/09
03/16/09
04/15/09
05/16/09
06/15/09
07/16/09
08/16/09
09/15/09
Date

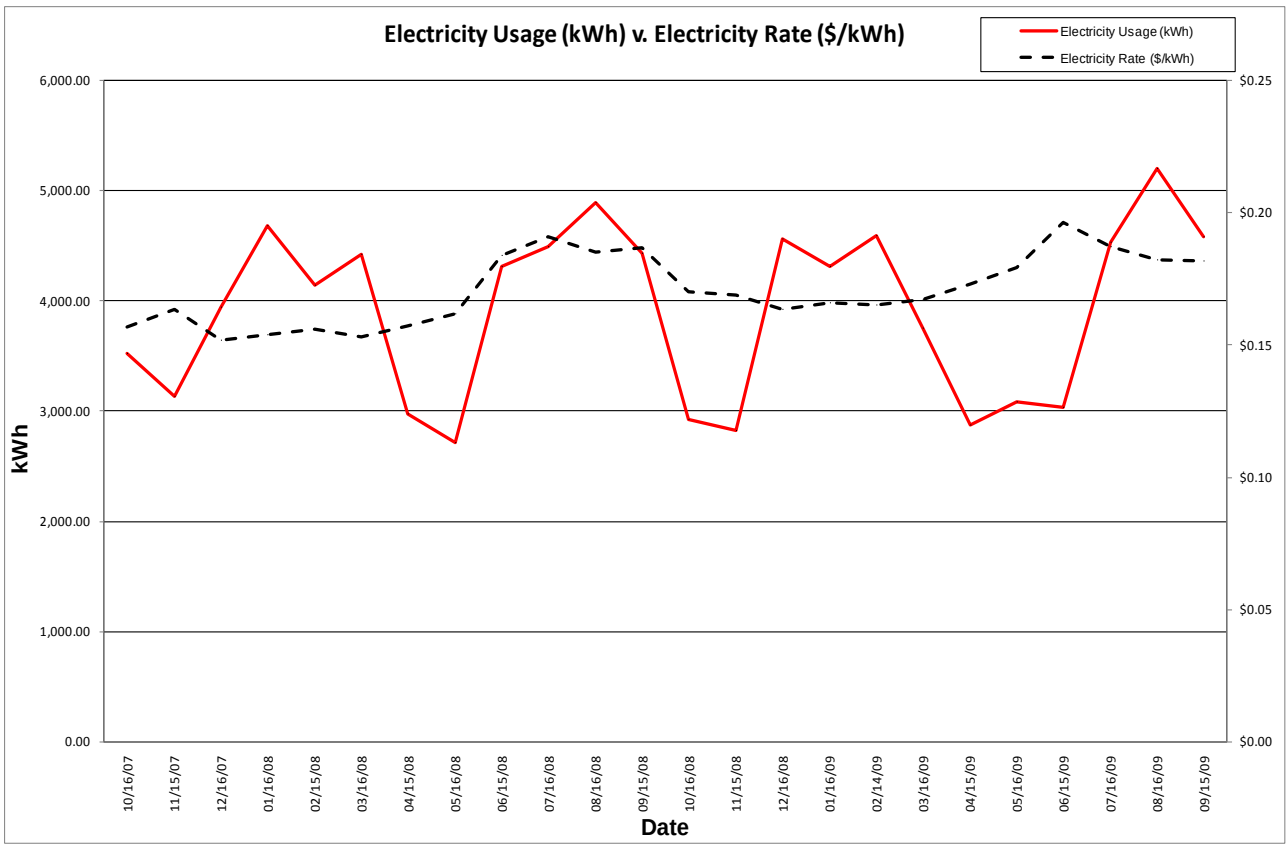


6.2 Energy Procurement strategies

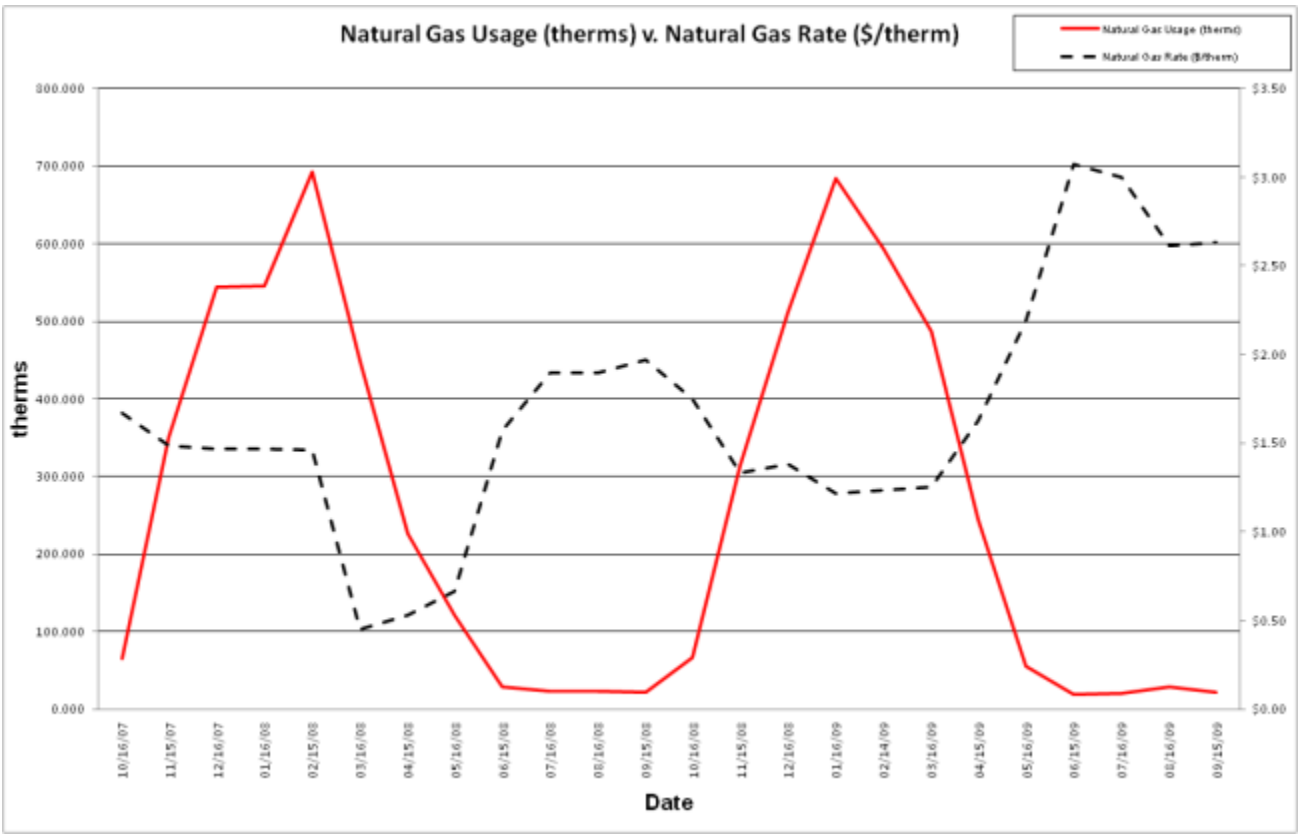
Billing analysis shows price fluctuations of over 20% over the course of the year for the building electrical and natural gas accounts. Customers that have a large variation in monthly billing rates can often reduce the costs associated with energy procurement by selecting a third party energy supplier. Contact the NJ Energy Choice Program for further information on Energy Services Companies (ESCOs) that can act as third party energy suppliers. Purchasing electricity from an ESCO can reduce electric rate fluctuation and ultimately reduce the annual cost of energy for the school.

Using an average of $0.15/kWh the Beachwood Community Center could save approximately $1,156.98 on their electric bills. The Beachwood Community Center already purchases natural gas from a third party supplier for $1.38/therm which is lower than the average rate of $1.55/therm. The costs per therm from the third party supplier for natural gas were calculated for some months based on previous months' averages

Appendix B contains a complete list of third party energy suppliers.



Electricity prices reflect electricity usage



Natural gas prices fluctuate as expected with usage

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 and established specialized equipment material and 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, BSG-PMK AND 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

Borough of Beachwood
Community Center
147 Compass Ave.

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	(2) 34W T12 Lamps, Magnetic Ballast / Replace with (2) 28W Lamps, Elec. Ballast	2L4' EE/STD	80	2L4' T8/ELEC	61	8	$75.00	$15.00
2	(4) 34W T12 lamps, Magnetic Ballast / Delamp and retrofit with with (2) 28W Lamps, Elec. Basllast, new reflector	4L4' EE/STD	160	2L4' T8/ELEC	61	11	$100.00	$15.00
3	(2) 34W T12 U-Tube Lamps, Magnetic Ballast / Replace with (2) 28W U-Tube Lamps, Elec. Ballast	2L22" STD/STD	94	2L22"	62	30	$60.00	$15.00
4	60W Incandecent / Replace with 26W CF	60W Inc	60	26W CF	26	34	$8.00	$0.00
5	100W Incandecent / Replace with 36W CF	100W Inc	100	32W CF	36	1	$10.00	$0.00
6								
7								
8								
9								
10								

Variables:

$0.1750	Avg. Electric Rate ($/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							7360				3939	3.421	8005	$3,782.00	$1,400.90	2.7			0	$0.00	$0.00		$735	$0	8005	$3,047.00	$1,400.90	2.2
1	1	Boiler Room	9	2340	2L4' EE/STD	1	80		2L4' T8/ELEC	1	61	0.019	44	$75.00	$7.78	9.6			0	$0	$0.00		$15	$0	44	$60.00	$7.78	7.7
2	2	Ice box Room	9	2340	4L4' EE/STD	1	160		2L4' T8/ELEC	1	61	0.099	232	$100.00	$40.54	2.5			0	$0	$0.00		$15	$0	232	$85.00	$40.54	2.1
3	1	Kitchen	9	2340	2L4' EE/STD	3	240		2L4' T8/ELEC	3	183	0.057	133	$225.00	$23.34	9.6			0	$0	$0.00		$45	$0	133	$180.00	$23.34	7.7
4	2		9	2340	4L4' EE/STD	1	160		2L4' T8/ELEC	1	61	0.099	232	$100.00	$40.54	2.5			0	$0	$0.00		$15	$0	232	$85.00	$40.54	2.1
5	3	Main Room	9	2340	2L22" STD/STD	30	2820		2L22"	30	1860	0.96	2246	$1,800.00	$393.12	4.6			0	$0	$0.00		$450	$0	2,246	$1,350.00	$393.12	3.4
6	1	Enterance	9	2340	2L4' EE/STD	4	320		2L4' T8/ELEC	4	244	0.076	178	$300.00	$31.12	9.6			0	$0	$0.00		$60	$0	178	$240.00	$31.12	7.7
7	5	Janitor Closet	9	2340	100W Inc	1	100		32W CF	1	36	0.064	150	$10.00	$26.21	0.4			0	$0	$0.00		$0	$0	150	$10.00	$26.21	0.4
8	2	Office	9	2340	4L4' EE/STD	2	320		2L4' T8/ELEC	2	122	0.198	463	$200.00	$81.08	2.5			0	$0	$0.00		$30	$0	463	$170.00	$81.08	2.1
9	2	Sewage	9	2340	4L4' EE/STD	2	320		2L4' T8/ELEC	2	122	0.198	463	$200.00	$81.08	2.5			0	$0	$0.00		$30	$0	463	$170.00	$81.08	2.1
10	2	Back Garage	9	2340	4L4' EE/STD	3	480		2L4' T8/ELEC	3	183	0.297	695	$300.00	$121.62	2.5			0	$0	$0.00		$45	$0	695	$255.00	$121.62	2.1
11		Conference Room	9	2340		4				4									0	$0	$0.00			$0				
12	4	Closet	9	2340	60W Inc	1	60		26W CF	1	26	0.034	80	$8.00	$13.92	0.6			0	$0	$0.00		$0	$0	80	$8.00	$13.92	0.6
13	2	Restroom	9	2340	4L4' EE/STD	1	160		2L4' T8/ELEC	1	61	0.099	232	$100.00	$40.54	2.5			0	$0	$0.00		$15	$0	232	$85.00	$40.54	2.1
14	2	Restroom	9	2340	4L4' EE/STD	1	160		2L4' T8/ELEC	1	61	0.099	232	$100.00	$40.54	2.5			0	$0	$0.00		$15	$0	232	$85.00	$40.54	2.1
15	4	Main Room	9	2340	60W Inc	20	1200		26W CF	20	520	0.68	1591	$160.00	$278.46	0.6			0	$0	$0.00		$0	$0	1,591	$160.00	$278.46	0.6
16	4		9	2340	60W Inc	13	780		26W CF	13	338	0.442	1034	$104.00	$181.00	0.6			0	$0	$0.00		$0	$0	1,034	$104.00	$181.00	0.6

Appendix B: Third Party Energy Suppliers (ESCOs)

Third Party Electric Suppliers for PSEG Service Territory	Telephone & Web Site
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com
BOC Energy Services, Inc. 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.boc.com
Commerce Energy, Inc. 4400 Route 9 South, Suite 100 Freehold, NJ 07728	(800) 556-8457 www.commerceenergy.com
ConEdison Solutions 535 State Highway 38 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 www.newenergy.com
Credit Suisse, (USA) Inc. 700 College Road East Princeton, NJ 08450	(212) 538-3124 www.creditsuisse.com
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com
FirstEnergy Solutions 300 Madison Avenue Morristown, NJ 07926	(800) 977-0500 www.fes.com
Glacial Energy of New Jersey, Inc. 207 LaRoche Avenue Harrington Park, NJ 07640	(877) 569-2841 www.glacialenergy.com
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	(888) 536-3876 www.metroenergy.com
Integrys Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrysenergy.com
Liberty Power Delaware, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866) 769-3799 www.libertypowercorp.com
Liberty Power Holdings, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(800) 363-7499 www.libertypowercorp.com
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) 363-7499 www.pepco-services.com
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com
Sempra Energy Solutions 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.semprasolutions.com
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.southjerseyenergy.com
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com
Strategic Energy, LLC 55 Madison Avenue, Suite 400 Morristown, NJ 07960	(888) 925-9115 www.sel.com
Suez Energy Resources NA, Inc. 333 Thornall Street, 6th Floor Edison, NJ 08837	(888) 644-1014 www.suezenergyresources.com
UGI Energy Services, Inc. 704 East Main Street, Suite 1 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com

Third Party Gas Suppliers for Elizabethtown Gas Co. Service Territory	Telephone & Web Site
Cooperative Industries 412-420 Washington Avenue Belleville, NJ 07109	(800) 628-9427 www.cooperativenet.com
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com
UGI Energy Services, Inc. 704 East Main Street, Suite 1 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com
Great Eastern Energy 116 Village Riva, Suite 200 Princeton, NJ 08540	(888) 651-4121 www.greateastern.com
Glacial Energy of New Jersey, Inc. 207 LaRoche Avenue Harrington Park, NJ 07640	(877) 569-2841 www.glacialenergy.com
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	(800) 724-1880 www.intelligentenergy.org
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	(877) 750-7046 www.metromediaenergy.com
MxEnergy, Inc. 510 Thornall Street, Suite 270 Edison, NJ 08837	(800) 375-1277 www.mxenergy.com
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	(800) 840-4427 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 Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.southjerseyenergy.com
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com
Woodruff Energy 73 Water Street Bridgeton, NJ 08302	(800) 557-1121 www.woodruffenergy.com