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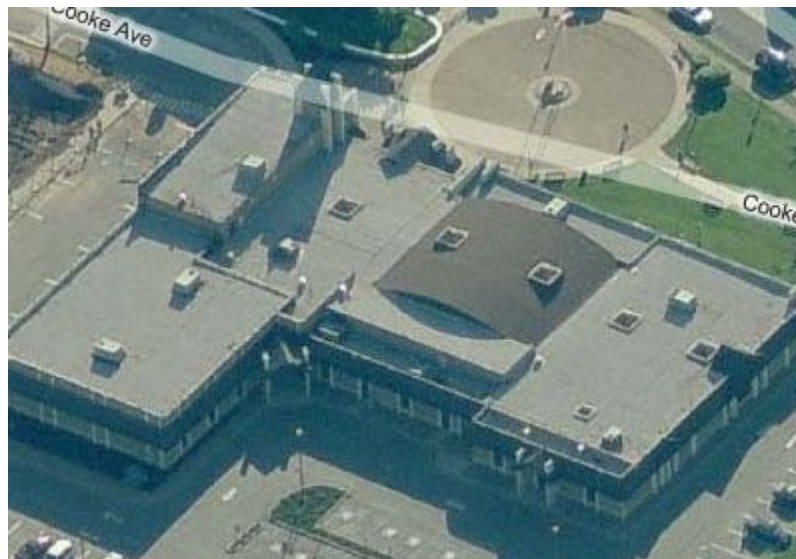
*June 09, 2010*

**Local Government Energy Program  
Energy Audit Report**

*For*

***Community Center and Library  
100 Cooke Avenue  
Carteret, NJ 07008***

***Project Number: LGEA24***



## TABLE OF CONTENTS

<b>INTRODUCTION</b> .....	<b>3</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>4</b>
<b>1. HISTORIC ENERGY CONSUMPTION</b> .....	<b>7</b>
1.1. ENERGY USAGE AND COST ANALYSIS.....	7
1.2. UTILITY RATE.....	8
1.3. ENERGY BENCHMARKING.....	8
<b>2. FACILITY AND SYSTEMS DESCRIPTION</b> .....	<b>11</b>
2.1. BUILDING CHARACTERISTICS.....	11
2.2. BUILDING OCCUPANCY PROFILES.....	11
2.3. BUILDING ENVELOPE.....	11
2.3.1. EXTERIOR WALLS.....	11
2.3.2. ROOF.....	11
2.3.3. BASE.....	11
2.3.4. WINDOWS.....	11
2.3.5. EXTERIOR DOORS.....	11
2.3.6. BUILDING AIR TIGHTNESS.....	11
2.4. HVAC SYSTEMS.....	12
2.4.1. HEATING.....	12
2.4.2. COOLING.....	12
2.4.3. VENTILATION.....	12
2.4.4. DOMESTIC HOT WATER.....	12
2.5. ELECTRICAL SYSTEMS.....	13
2.5.1. LIGHTING.....	13
2.5.2. APPLIANCES AND PROCESS.....	13
2.5.3. ELEVATORS.....	13
2.5.4. OTHER ELECTRICAL SYSTEMS.....	13
<b>3. EQUIPMENT LIST</b> .....	<b>14</b>
<b>4. ENERGY CONSERVATION MEASURES</b> .....	<b>15</b>
<b>CATEGORY I RECOMMENDATIONS: CAPITAL IMPROVEMENT MEASURES</b> .....	<b>15</b>
<b>CATEGORY II RECOMMENDATIONS: OPERATIONS AND MAINTENANCE</b> .....	<b>15</b>
<b>CATEGORY III RECOMMENDATIONS: ENERGY CONSERVATION MEASURES</b> .....	<b>15</b>
<b>5. RENEWABLE AND DISTRIBUTED ENERGY MEASURES</b> .....	<b>19</b>
5.1. EXISTING SYSTEMS.....	20
5.2. SOLAR PHOTOVOLTAIC.....	20
5.3. SOLAR THERMAL COLLECTORS.....	20
5.4. COMBINED HEAT AND POWER.....	20
5.5. GEOTHERMAL.....	20
5.6. WIND.....	20
<b>6. ENERGY PURCHASING AND PROCUREMENT STRATEGIES</b> .....	<b>20</b>
6.1. LOAD PROFILES.....	20
6.2. ENERGY PROCUREMENT STRATEGIES.....	22
<b>7. METHOD OF ANALYSIS</b> .....	<b>24</b>
7.1. ASSUMPTIONS AND METHODS.....	24
7.2. DISCLAIMER.....	24
<b>APPENDIX A: LIGHTING STUDY</b> .....	<b>25</b>
<b>APPENDIX B: THIRD PARTY ENERGY SUPPLIERS (ESCOs)</b> .....	<b>27</b>

## **INTRODUCTION**

On November 13, 2009 and January 7, 2010, 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 Community Center & Library. The building is located at 100 Cooke Ave, Carteret, NJ 07008, in Middlesex County. The current conditions and energy-related information were collected in order to analyze the implementation of energy conservation measures for the building.

The two-story facility, built in 1940 is 15,336 square feet in area. The building includes the borough's several municipal departments and offices. The building is open from 9:00am to 8:00pm Monday through Thursday, 9:00am to 5:00pm Friday and Saturday, and closed on Sundays.

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

Launched in 2008, the Local Government Energy Audit (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.

## EXECUTIVE SUMMARY

This document contains the energy audit report for the Library & Community Center, located at 100 Cooke Ave, Carteret, New Jersey 07008.

Based on the field visits performed by SWA and BSG-PMK staff on November 13, 2009 and January 7, 2010 and the results of a comprehensive energy analysis, this report describes the site's current conditions and recommendations for improvements. Suggestions for measures related to energy conservation and improved comfort are provided in the scope of work. Energy and resource savings are estimated for each measure that results in a reduction of heating, cooling, and electric usage.

### Current conditions

In the most recent full year of data collected, March, 2008 through February, 2009, the Library & Community Center consumed a total of 385,600 kWh of electricity for a total cost of \$62,317, and 8,420 therms of natural gas for a total cost of \$8,805.

With electricity and fossil fuel combined, the building consumed 2,157.7 MMBtus of energy at a total cost of \$71,122.

SWA/BSG-PMK has entered energy information about the Library & Community Center 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. 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.

The building performance rating could not be determined because the electric-utility consumption data provided is greater than 120 days old.

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

(Refer to Section 1.3 for Energy Star Rating)

### Category I Recommendations: Capital Improvement Measures

- 1) Replace the current water heater with a 40 gallon, gas-fired unit. Although this unit is not very expensive, the payback is still too high to be considered an ECM.

### Category II Recommendations: Operations and Maintenance

- 1) Based on BSG-PMK's survey, no operations and maintenance measures are recommended, as the facility was recently renovated.

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

At this time, SWA/BSG-PMK highly recommends a total of two (2) Energy Conservation Measures (ECMs) for the Community Center and Library which are summarized in the following Table 1. The total investment cost for these ECMs, without incentives, is **\$3,270**, and with incentives, is **\$2,893**. SWA/BSG-PMK estimates a first year savings of **\$1,319** with a simple payback of **2.2 years**. SWA estimates that implementing the highly recommended ECMs will reduce the carbon footprint of the Community Center and Library by **13,049 lbs of CO<sub>2</sub>**. SWA also recommends that the Borough of Carteret contacts third party energy suppliers in order to negotiate a lower electricity rate. Comparing the current electric rate to average utility rates of similar type buildings in New Jersey, it may be possible to save up to \$ 0.01/kWh, which would have equated to \$4,477.00 for the past 12 months

There are various incentives that the Borough of Carteret could apply for that could also help lower the cost of installing the ECMs. SWA/BSG-PMK recommends 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 124.0 kW.

The following tables summarize 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 <sub>2</sub> Reduced, lbs/yr
1	Lighting Upgrades	Empirical Data	\$390	\$0	\$390	2,942	0.7	0	0.65	\$0.00	\$471	15	\$5,539	0.83	1320%	88%	121%	\$4,616	4,031
	Occupancy Sensors		\$1,380	\$375	\$1,005	1,129	0.3	0	0.25	\$0.00	\$181	10	\$1,525	5.56	52%	5%	12%	\$536	1,547
2	Hot Water Outdoor Air Reset Control	Struble Mechanical Services, Fairfield, NJ	\$1,500	\$0	\$1,500	0	0.0	639	4.16	\$0.00	\$668	10	\$5,638	2.25	276%	28%	43%	\$4,196	7,471
TOTAL			\$3,270	\$375	\$2,895	4,072	0.9	639	5.07	\$0.00	\$1,319	-	\$12,703	2.19	-	-	-	\$9,348	13,049

ROI: Return on Investment (%)

**Assumptions:**

Discount rate: 3.2% per DOE FEMP guidelines

Electricity rate: \$0.16 \$/kWh

Energy price escalation rate: 0% per DOE FEMP guidelines

Gas rate: \$1.05 \$/therm

Area of Building (SF) 15,336

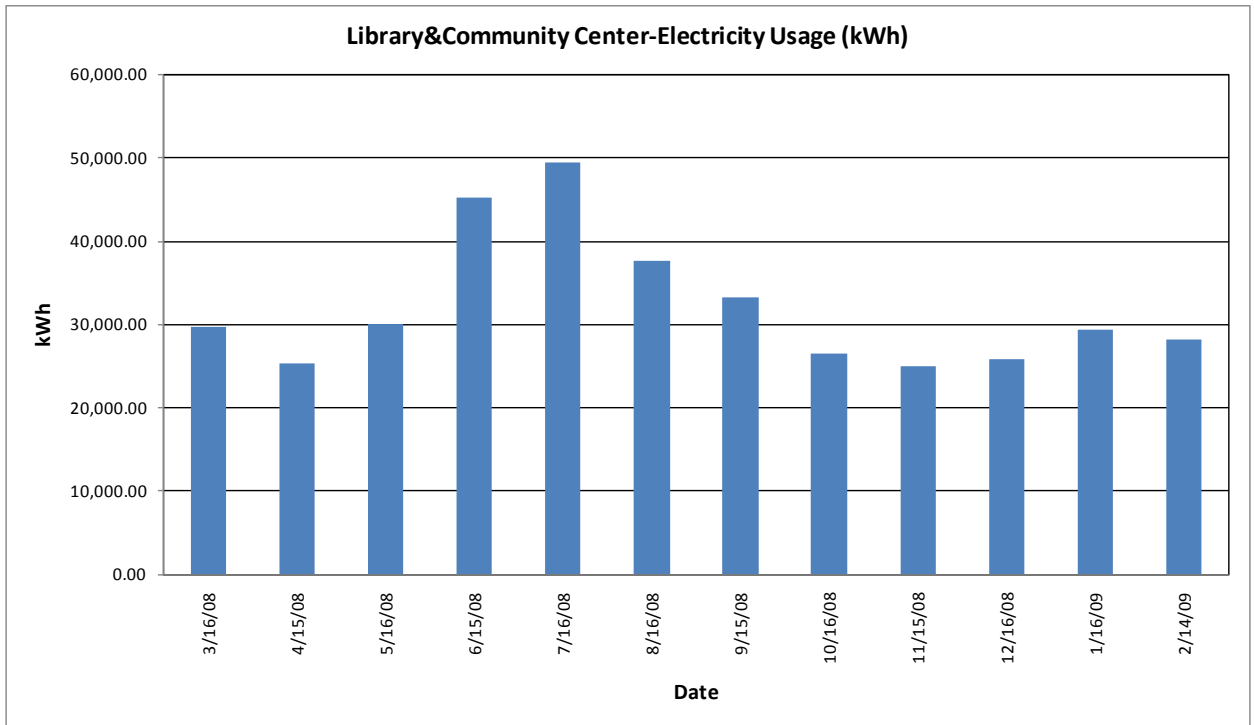
# 1. HISTORIC ENERGY CONSUMPTION

## 1.1. Energy usage and cost analysis

SWA/BSG-PMK analyzed utility bills from March, 2008 through February, 2009 that were received from the utility companies supplying the Library & Community Center with electric and natural gas.

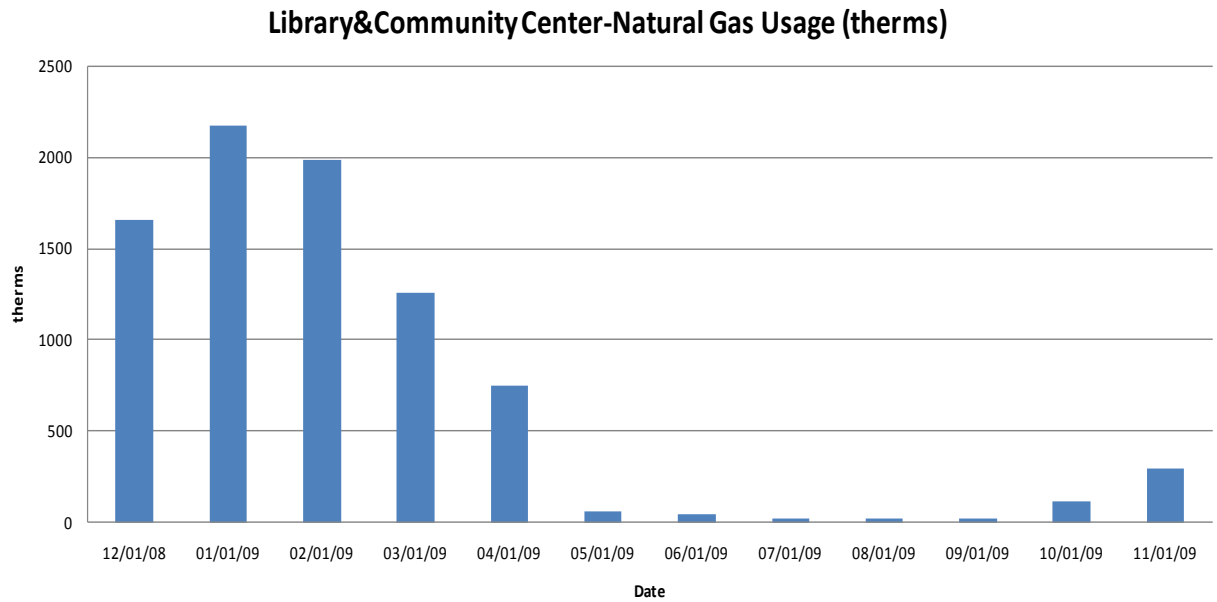
Electricity - The Library & Community Center is currently served by one electric meter and purchases electricity from Public Service Electric & Gas at **an average rate of \$0.16/kWh** based on 12 months of utility bills from March, 2008 through February, 2009. The building purchased **385,600 kWh or \$62,317 worth of electricity** during that time span.

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



Natural Gas - The Library & Community Center is currently served by one natural gas meter and buys gas from Elizabethtown Gas at **an average rate of \$1.05/therm** based on 12 months of utility bills from December, 2008 through November, 2009. The building purchased **8,420 therms or \$8,805 worth of natural gas** during that time span.

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



### 1.2. Utility rate

The Library & Community Center currently purchases electricity from Public Service Electric & Gas for electricity use (kWh) with a separate (kW) demand charge. The complex currently pays an average rate of approximately \$0.16/kWh based on the 12 months of utility bills of March, 2008 through February, 2009.

The Library & Community Center currently purchases natural gas supply and transmission from Elizabethtown Gas at an average aggregated rate of \$1.05/therm based on 12 months of utility bills from December, 2008 through November, 2009.

### 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. BSG-PMK and SWA recommend that the Borough maintain the Portfolio Manager account at the link below. As the account is maintained, BSG-PMK and 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](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager)

**Username:** boroughofcarteret  
**Password:** carteret

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.

The calculated Site Energy Use Intensity is 141 kBtu/ft<sup>2</sup>yr. Implementing this report's recommendations will reduce use by approximately 5.1 kBtu/ft<sup>2</sup>yr, which when implemented would lower the buildings energy consumption.



## STATEMENT OF ENERGY PERFORMANCE Community Center & Library

Building ID: 2035795  
For 12-month Period Ending: October 31, 2009<sup>1</sup>  
Date SEP becomes ineligible: N/A

Date SEP Generated: March 18, 2010

**Facility**  
Community Center & Library  
100 Cooke Ave  
Carteret, NJ 07008

**Facility Owner**  
Borough of Carteret  
61 Cooke Ave  
Carteret, NJ 07008

**Primary Contact for this Facility**  
Anthony Neibert  
61 Cooke Ave  
Carteret, NJ 07008

**Year Built:** 2007  
**Gross Floor Area (ft<sup>2</sup>):** 15,336

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

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

Electricity - Grid Purchase(kBtu)	1,315,667
Natural Gas (kBtu) <sup>4</sup>	885,468
Total Energy (kBtu)	2,201,135

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

Site (kBtu/ft <sup>2</sup> /yr)	144
Source (kBtu/ft <sup>2</sup> /yr)	347

### Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO <sub>2</sub> e/year)	247
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### 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	63%
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.

### Meets Industry Standards<sup>6</sup> for Indoor Environmental Conditions:

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

**Certifying Professional**  
N/A

#### Notes:

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

## **2. FACILITY AND SYSTEMS DESCRIPTION**

### **2.1. Building Characteristics**

The Library and Community Center was built in 1940, and was recently renovated by the Borough. The one-story building has a total area of 15,336 square feet. The Library and Community Center is the public library as well as a community center used by seniors and residents as a gathering place for events complete with kitchen and game room.

### **2.2. Building occupancy profiles**

The building is open from 9:00am to 8:00pm Monday through Thursday, 9:00am to 5:00pm Friday and Saturday and closed Sunday and could be opened at off hours for special events. There are approximately 15 employees.

### **2.3. Building envelope**

#### **2.3.1.Exterior walls**

The exterior walls are constructed from brick and mortar with a masonry substrate and finished with a sprayed-on exterior coating of EFIS. The walls are in good condition.

#### **2.3.2.Roof**

The roof is finished with asphalt and has a perimeter mansford.

#### **2.3.3.Base**

There is a basement at the Library and Community Center. The base of the building is poured concrete below grade.



#### **2.3.4.Windows**

There are approximately 30 double-pane aluminum framed windows on the building. All are in good condition.

#### **2.3.5.Exterior doors**

The exterior doors are in good condition. The front doors are aluminum doors with large glass panes, and there are two sets of doors. The side and rear door are the same.

#### **2.3.6.Building air tightness**

The building is air tight and there are no occupant complaints or signs of outside air infiltration.

## **2.4. HVAC systems**

### **2.4.1. Heating**

The Community Center and Library's heating is generated by a gas-fired hot water boiler. The nameplate, along with the model and manufacturer, was missing. The unit was installed in 1995 and is in good condition. Outdoor air reset control is not employed. The hot water is circulated to several rooftop units, most of which had missing nameplates. The only two that did have nameplates were two Rheem units, both with 135 MBH heating coils. No blueprints were available, and zones the units served were not indicated.

Category III Recommendations – ECM #2: Install hot water outdoor air reset control. These controllers reduce the maximum boiler water temperature depending on the outside air temperature; for instance, if the outside air temperature is 0°F, the boiler temperature will be 180°F, but if the outside air temperature is 40°F, the boiler temperature will only need to be 130°F

### **2.4.2. Cooling**

Cooling is provided by split-system condensing units and rooftop units.

A small Bearward condensing unit is located on the roof; no specifications could be found for the unit, and its age could not be determined. It was in good condition.

One office is served by a 3 ton, 15 SEER Fujitsu split-system condensing unit, which feeds a Fujitsu wall-mounted air-handler. The units are less than two years old and are in good condition.

There are ten Rheem DX rooftop units. Blueprints were not available, and the areas served could not be determined. A 5 ton unit, with model # RAKA-060CAS, provided cooling only. Two units, one a 4 ton unit with model # RKKA-A048DL13E and the other a 5-ton unit with model # RKKA-A060DL13E, each circulate 135 MBH of heating provided by the boiler. There are seven other rooftop units, all of which were missing nameplates. They all appear to be between 7.5 and 15 tons, and some, or all, may also circulate heat from the boiler.

### **2.4.3. Ventilation**

Ventilation is provided by the rooftop units, exhaust fans on the roof, doors, and windows.

### **2.4.4. Domestic Hot Water**

Water is heated by a 40 gallon, 40 MBH gas-fired water heater, which is about 12 years old. It is a Bradford White unit with model # M1403 T6EN12.

Category I Recommendation – Capital Investments #1: Replace the current water heater with a 40 gallon, gas-fired unit. Although this unit is not very expensive, the payback is still too high to be considered an ECM.

## **2.5. Electrical systems**

### **2.5.1. Lighting**

A complete inventory of all interior, exterior, and exit sign light fixtures were examined and documented in Appendix A of this report including an estimated total lighting power consumption. Our initial findings indicate that performing a detailed lighting upgrade per the recommendations in Appendix A will result in an annual savings of \$651.46 based on the current \$0.16/kWh and the current occupancy schedule. Implementation of this ECM will cost approximately \$1,770. Currently the Board of Public Utilities (BPU) would offer an estimated rebate of \$375, yielding a net cost of \$1,395 for this project. With a yearly savings of \$651.46 the payback on this ECM would about 2.1 years.

Category III Recommendation - ECM #1: Recommend upgrading incandescent light fixtures with compact fluorescent lamps, as well as various other lighting upgrades outlined in Appendix A. Also recommend installing lighting sensors to certain areas where lights typically remain lit when unoccupied for long periods of time.

**Refer to Appendix A for further details.**

### **2.5.2. Appliances and process**

There are several computers (not all areas were accessible for an accurate count) and coffee makers, a refrigerator, and other cooking equipment in the senior center.

### **2.5.3. Elevators**

This facility is one-story and does not have an elevator.

### **2.5.4. Other electrical systems**

There are currently no other significant energy impacting electrical systems installed at the Community Center and Library.

### 3. EQUIPMENT LIST

Building System	Description	Location	Model #	Fuel	Space Served	Year Installed	Estimated Remaining Useful Life %
Cooling	Small condensing unit, specs not found	Roof	Bearward M# V-Remote, P# 54277-192, S# D93100	Electricity	Unknown	Unknown	Unknown
Cooling	5-hp, 1,740 RPM motor; 87.5% efficient	Attached to Bearward CU	Magnetek Century E Plus P# 9-391-327-63	Electricity	Bearward condensing unit	approx. 2000	50%
Cooling	Split-system condensing unit; 3 tons, 15 SEER	Roof	Fujitsu M# AOU36CLX	Electricity	Single office (via Fujitsu air-handler)	approx. 2008	93%
Cooling	Split-system, wall-mounted air-handler	Office, mounted on wall	Fujitsu M# ASU36CLX	Electricity	Single office	approx. 2008	93%
Cooling	DX rooftop unit, 5 tons	Roof	Rheem RAKA-060CAS	Electricity	Unknown (no blueprints available)	approx. 2000	40%
Cooling/Heating	DX rooftop unit, 4 tons; also 135 MBH gas heat	Roof	Rheem RKKA-A048DL13E	Electricity / Natural Gas	Unknown (no blueprints available)	approx. 2000	40%
Cooling/Heating	DX rooftop unit, 5 tons; also 135 MBH gas heat	Roof	Rheem RKKA-A060DL13E	Electricity / Natural Gas	Unknown (no blueprints available)	approx. 2000	40%
Cooling/Heating	7 other DX rooftop units, between 7.5 and 15 tons, some possibly with heat; nameplate missing, so specs not available	Roof	Rheem (nameplate missing)	Electricity / Natural Gas	Unknown (no blueprints available)	approx. 2001	63%
Domestic Hot Water	Domestic water heater; 40 gallons, 40 MBH	Mechanical room	Bradford White M# M1403 T6EN12	Natural Gas	Entire building	1998	15%
Heating	Gas-fired, hot water boiler, formerly oil-fired; nameplate missing, so no specs	Mechanical room	Unknown (nameplate not available)	Natural Gas	Heating coils in air-handlers	approx. 1995	40%
Backup Power	Backup generator; 1,800 RPM	Mechanical room	Kohler M# 80R2	Natural Gas	Entire building	1999	60%
Backup Power	Two motors, specs not found	Attached to backup generator	Ford M# LSG875I-6005-A	Electricity	Backup generator	1999	50%

**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 Improvement Measures**

- 1) Replace the current water heater with a 40 gallon, gas-fired unit. Although this unit is not very expensive, the payback is still too high to be considered an ECM.

##### **Category II Recommendations: Operations and Maintenance**

- 1) Based on BSG-PMK's survey, no operations and maintenance measures are recommended, as the facility was recently renovated.

##### **Category III Recommendations: Energy Conservation Measures**

##### **Summary table**

<b>ECM #</b>	<b>ECM Description</b>
<b>1</b>	<b>Lighting Upgrades and Occupancy Sensors</b>
<b>2</b>	<b>Hot Water Outdoor Air Reset Control</b>

## ECM#1: Lighting Upgrades and Occupancy Sensors

### Description:

Lighting at the Carteret Community Center consists primarily of energy efficient T-8 lamps with electronic ballasts. There are also many incandescent lamps in use which should be replaced with compact fluorescents. Lighting replacement generally yields a very good payback, due to the fact that most lighting usage in commercial buildings is fairly high and the installation is relatively inexpensive.

The use of occupancy sensors, which is a lighting control that will turn off power to the lights when a room is not occupied, is also recommended. Rooms that were determined to be prime candidates for occupancy sensors are marked on the lighting spreadsheet (Appendix A).

### Installation cost:

Estimated installed cost:

	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
<b>Cost</b>	\$390.00	\$1,380.00	\$1,770.00
<b>Rebate</b>	\$0.00	\$375.00	\$375.00
<b>Net Cost</b>	\$390.00	\$1,005.00	<b>\$1,395.00</b>
<b>Savings (kWh)</b>	2,942	1,129	<b>4,072</b>
<b>Savings (\$)</b>	\$470.79	\$180.67	<b>\$651.46</b>
<b>Payback</b>	0.8	5.6	<b>2.1</b>

Source of cost estimate: RS Means/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/eq 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	\$390	\$0	\$390	2,942	0.7	0	0.65	\$0.00	\$471	15	\$5,539	0.83	1320%	88%	121%	\$4,616	4,031
	Occupancy Sensors	Data	\$1,380	\$375	\$1,005	1,129	0.3	0	0.25	\$0.00	\$181	10	\$1,525	5.56	52%	5%	12%	\$536	1,547

**Assumptions:**

The electric cost used in this ECM was \$0.16/kWh, which was the facilities average rate for the 12-month period ranging from March 1, 2008 through February 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 offers rebates for upgrading lighting fixtures and installing lighting controls. The total rebate this ECM qualifies for is \$375.

## ECM#2: Hot Water Outdoor Air Reset Control

### Description:

Heating is provided to the Community Center and Library by gas-fire hot water boiler, located in the mechanical room. This boiler is in good condition, and its operation can be made even more efficient by installing outdoor air reset control. Boilers are designed to provide water to radiators or hot water coils at a constant temperature, usually 180°F. This can cause the system to provide too high a temperature to the space it was designed to heat, which wastes energy and increases gas bills. Outdoor air reset controllers reduce the maximum boiler water temperature depending on the outside air temperature; for instance, if the outside air temperature is 0°F, the boiler temperature will be 180°F, but if the outside air temperature is 40°F, the boiler temperature will only need to be 130°F.

### Installation cost:

Estimated installed cost: \$1,500

Source of cost estimate: Struble Mechanical Services, Fairfield, NJ

### 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
2	Hot Water Outdoor Air Reset Control	Struble Mechanical Services, Fairfield, NJ	\$1,500	\$0	\$1,500	0	0.0	639	4.16	\$0.00	\$667.73	10	\$5,638	2.25	276%	28%	43%	\$4,196	7,471

### Assumptions:

Outside air reset controllers typically save between 8% and 15% of the annual heating consumption; to be conservative, the lower end of this range, 8%, will be used. From December, 2008 through November, 2009, the Community Center and Library consumed 8,420 therms at a rate of \$1.05 per therm. In the months of May through September, 2009, the natural gas consumption was consistently low, always between 21.8 and 62.4 therms; during these months, the boilers were not in use, and the only gas consumption was from the domestic water heater. It can be assumed that the average for these months, 36.5 therms, is the amount of gas used to heat water each month during the heating season, bringing the gas consumed by the boiler to 7,981 therms.

### Rebates/financial incentives:

No rebates for outside air reset control are available.

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, ARRA grants available through the NJ Office of Clean Energy, 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](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 pay 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**

Photovoltaic (PV) technology would not be feasible because of the orientation of the building and the amount of roof space that has unobstructed southern exposure.

### **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.

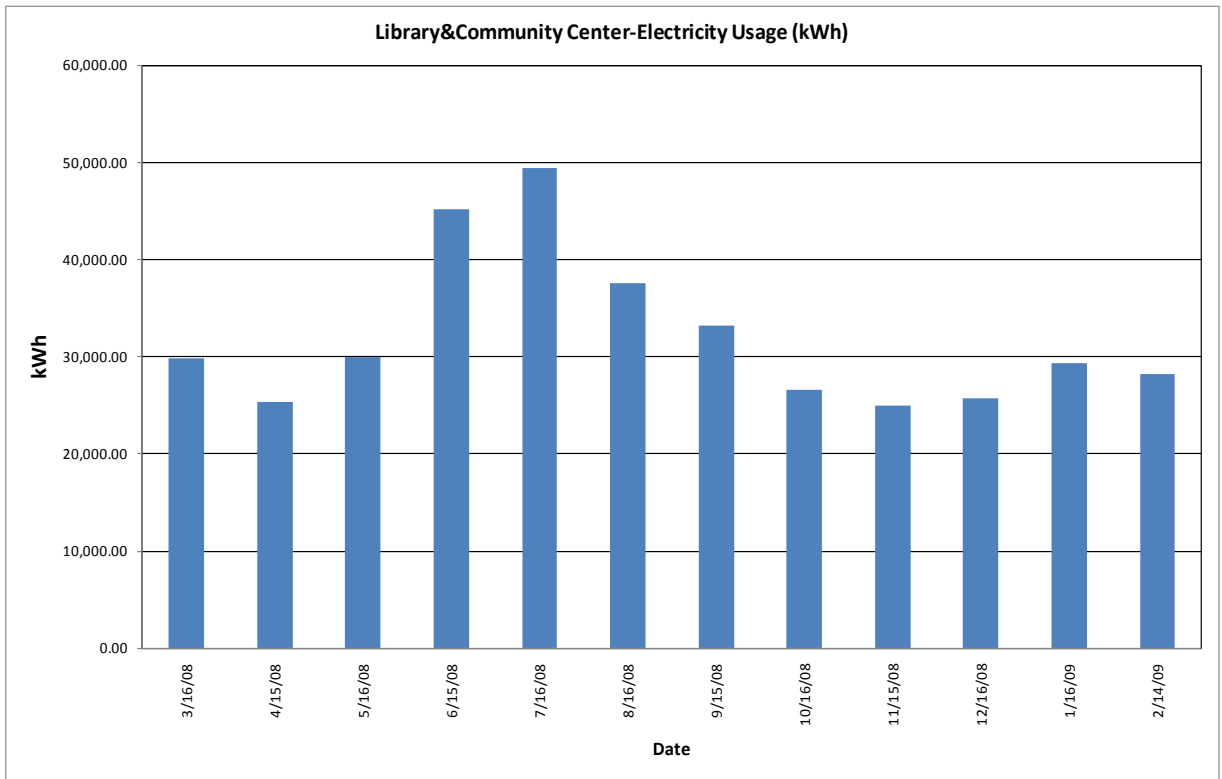
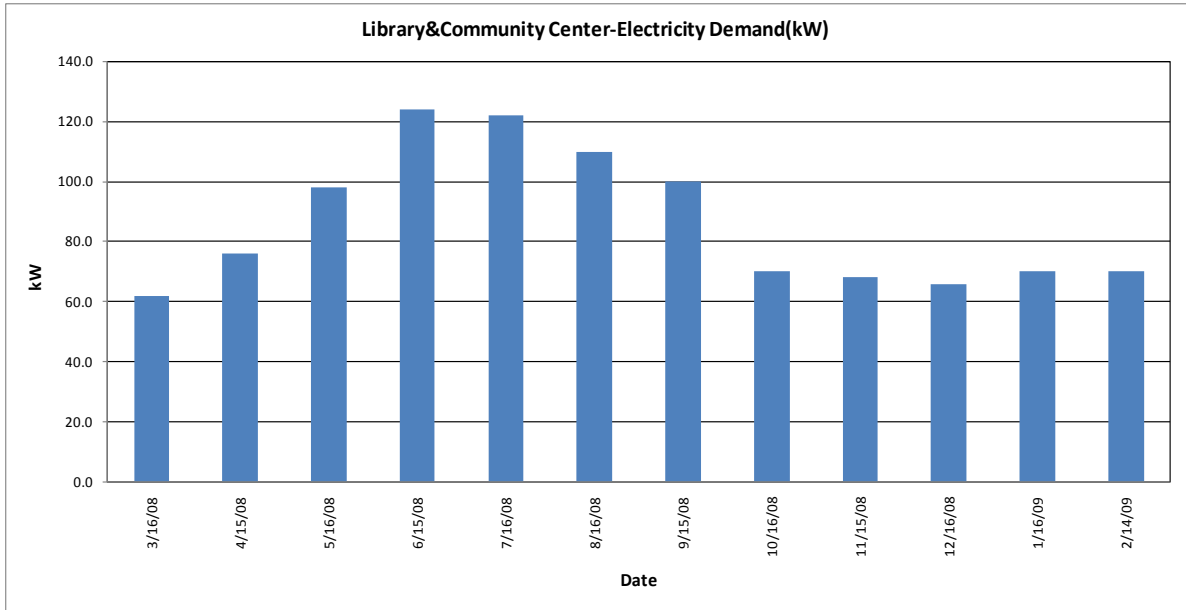
### **5.6. Wind**

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

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

### **6.1. Load Profiles**

The average electrical peak demand for the facility during previous year was 86.3 kW and the maximum peak demand was 124 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.

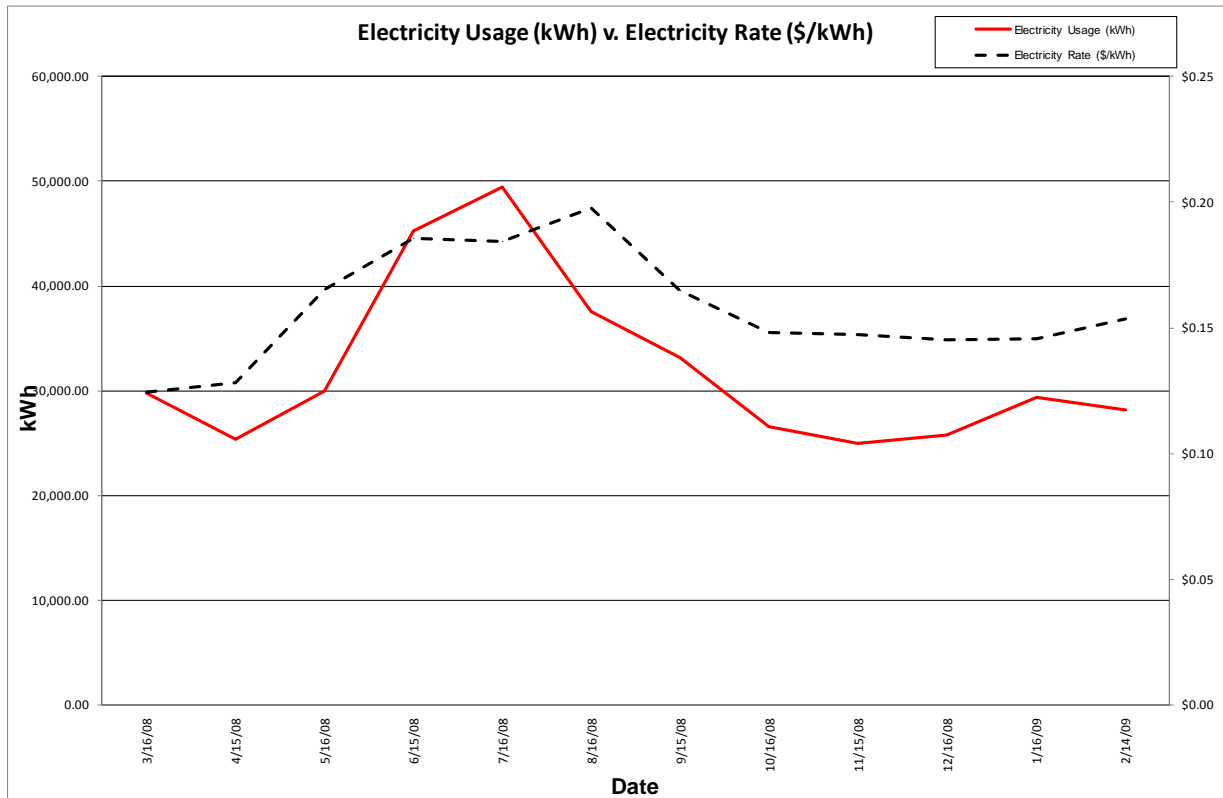


Currently, New Jersey commercial buildings of similar type pay \$0.150/kWh for electricity and \$1.55/therm for natural gas. The electricity rate for the building is \$.16/kWh, which means there is a potential cost savings of \$4,477.00 per year. The gas rate for the building is \$1.05/therm which is better than the average gas cost. A savings potential for electricity exists, however this involves contacting third party suppliers and negotiating utility rates. SWA recommends that the Borough of Carteret further explore opportunities of purchasing electricity from third party energy suppliers in order to reduce rate fluctuation and ultimately reduce the annual cost of energy for the building.

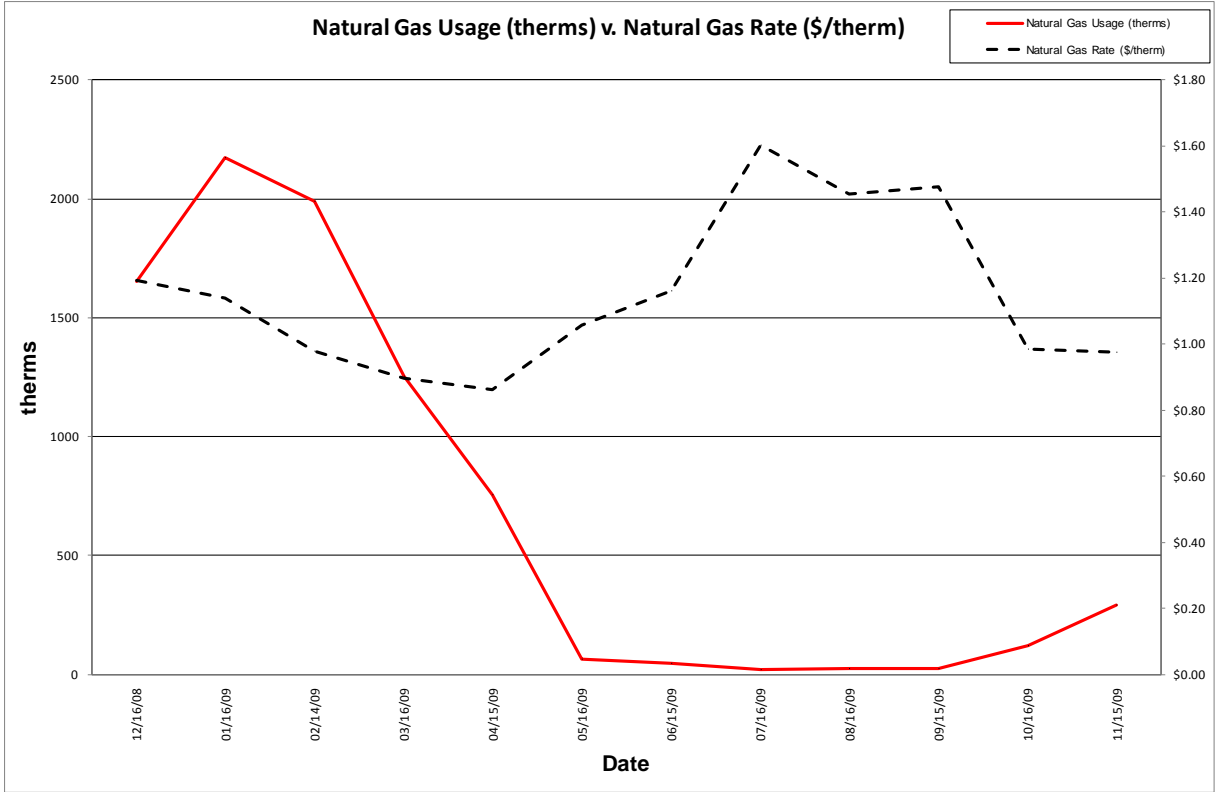
Appendix B contains a complete list of third party energy suppliers for the Borough of Carteret service area.

## 6.2. Energy Procurement Strategies

Billing analysis shows price fluctuations 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. 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 methods

Energy modeling method: Spreadsheet-based calculation methods

Cost estimates: RS Means 2009 (Facilities Maintenance & Repair Cost Data)

RS Means 2009 (Building Construction Cost Data)

RS Means 2009 (Mechanical Cost Data)

Note: Cost estimates also based on utility bill analysis and prior experience with similar projects.

### 7.2. Disclaimer

This engineering audit was prepared using the most current and accurate fuel consumption data available for the site. The estimates that it projects are intended to help guide the owner toward best energy choices. The costs and savings are subject to fluctuations in weather, variations in quality of maintenance, changes in prices of fuel, materials, and labor, and other factors. Although we cannot guarantee savings or costs, we suggest that you use this report for economic analysis of the building and as a means to estimate future cash flow.

***THE RECOMMENDATIONS PRESENTED IN THIS REPORT ARE BASED ON THE RESULTS OF ANALYSIS, INSPECTION, AND PERFORMANCE TESTING OF A SAMPLE OF COMPONENTS OF THE BUILDING SITE. ALTHOUGH CODE-RELATED ISSUES MAY BE NOTED, SWA STAFF HAVE NOT COMPLETED A COMPREHENSIVE EVALUATION FOR CODE-COMPLIANCE OR HEALTH AND SAFETY ISSUES. THE OWNER(S) AND MANAGER(S) OF THE BUILDING(S) CONTAINED IN THIS REPORT ARE REMINDED THAT ANY IMPROVEMENTS SUGGESTED IN THIS SCOPE OF WORK MUST BE PERFORMED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS THAT APPLY TO SAID WORK. PARTICULAR ATTENTION MUST BE PAID TO ANY WORK WHICH INVOLVES HEATING AND AIR MOVEMENT SYSTEMS, AND ANY WORK WHICH WILL INVOLVE THE DISTURBANCE OF PRODUCTS CONTAINING MOLD, ASBESTOS, OR LEAD.***

# LIGHTING ANALYSIS

Borough of Carteret  
Community Center  
100 Cooke Avenue



Upgrade Code	Upgrade Description	Existing		Proposed		Lighting		
		Fixture	Watts	Fixture	Watts	Total # of Upgrades	Cost per Upgrade (\$)	SmartStart Rebate per Upgrade
1	(3) 4' 32W T8 Lamps, Electronic Ballast / No Upgrade	3L4' T8/ELEC	89	No Upgrade	89	202	\$0.00	\$0.00
2	(2) 4' 32W T8 Lamps, Electronic Ballast / No Upgrade	2L4' T8/ELEC	61	No Upgrade	61	97	\$0.00	\$0.00
3	(2) 32W T8 U-Tube Lamps, Electronic Ballast / No Upgrade	2L22"	62	No Upgrade	62	19	\$0.00	\$0.00
4	2 Prong Compact Fluorescent / No Upgrade	(2) 13W CF/HW	30	No Upgrade	30	17	\$0.00	\$0.00
5	(4) 4' 32W T8 Lamps, Electronic Ballast / No Upgrade	4L4' T8/ELEC	110	No Upgrade	110	41	\$0.00	\$0.00
6	(1) 4' 32W T8 Lamps, Electronic Ballast / No Upgrade	1L4' T8/ELEC	31	No Upgrade	31	4	\$0.00	\$0.00
7	LED Exit Sign / No Upgrade	LED	2	No Upgrade	2	12	\$0.00	\$0.00
8	(2) 2 Prong Compact Fluorescent / No Upgrade	(2) 9W CF/HW	22	No Upgrade	22	2	\$0.00	\$0.00
9	70W Metal Halide/ No Upgrade	70W MH/BALLAST	95	No Upgrade	95	94	\$0.00	\$0.00
10	85W Incandescent Flood Lamp / Replace with 26W Compact Fluorescent	85W INCANDESCENT	85	26W CF	28	26	\$15.00	\$0.00
11	Compact Fluorescent Jelly-Jar fixture / No Upgrade	26W CF/SI	28	No Upgrade		1	\$0.00	\$0.00
12						0	\$0.00	\$0.00

### Summary

	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
<b>Cost</b>	\$390.00	\$1,380.00	\$1,770.00
<b>Rebate</b>	\$0.00	\$375.00	\$375.00
<b>Net Cost</b>	\$390.00	\$1,005.00	\$1,395.00
<b>Savings (kWh)</b>	2,942	1,129	4,072
<b>Savings (\$)</b>	\$470.79	\$180.67	\$651.46
<b>Payback</b>	0.8	5.6	2.1

### Variables:

\$0.16	Avg. Electric Rate (\$/kWh)
	Avg. Demand Rate (\$/kW)
3120	Operating Hours/Year
11	Operating Hours/Work Day

### Assumptions:

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

### Notes:

Seq. #	Upgrade Code	Room/Area	Hrs/Work Day	Hrs/Year	Existing				Proposed				Lighting				Occupancy Sensors (ONLY)				SmartStart Rebate				Lighting & Occupancy Sensors			
					Fixture	Qty.	Watts	Foot Candles	Fixture	Qty.	Watts	kW Reduction	Energy Savings, kWh	Cost (\$)	Savings (\$)	Payback (yrs)	Type	Qty.	Energy Savings, kWh	Cost (\$)	Savings (\$)	Payback (yrs)	Lighting	Sensors	Energy Savings, kWh	Post-Rebate Cost (\$)	Savings (\$)	Payback (yrs)
<b>Totals:</b>					41453		39943	1.482	2942	\$390.00	\$470.79	0.8			1129	\$1,380.00	\$180.67	7.6	\$0.00	\$375.00	4072	\$1,395.00	\$651.46	2.1				
1	1	Foyer	8	2269	3L4' T8/ELEC	2	178		No Upgrade	2	178	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
2	1	Lobby	8	2269	3L4' T8/ELEC	3	267		No Upgrade	3	267	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
3	2	Library Comp. Room	8	2269	2L4' T8/ELEC	15	915		No Upgrade	15	915	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
4	1	Main Library Hall	15	4255	3L4' T8/ELEC	38	3382		No Upgrade	38	3382	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
5	3		15	4255	2L22"	8	496		No Upgrade	8	496	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
6	2		15	4255	2L4' T8/ELEC	54	3294		No Upgrade	54	3294	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
7	4		15	4255	(2) 13W CF/HW	12	360		No Upgrade	12	360	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
8	3	Teen Young Adult Zone	8	2269	3L4' T8/ELEC	8	496		No Upgrade	8	496	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
9	1	Childrens Section	8	2269	3L4' T8/ELEC	20	1730		No Upgrade	20	1730	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
10	1	Office	8	2269	3L4' T8/ELEC	2	178		No Upgrade	2	178	0	0	\$0.00	\$0.00	OSW	1	101	\$200.00	\$16.16	12.4	\$0.00	\$20.00	101	\$180.00	\$16.16	11.1	
11	1	Foyer	8	2269	3L4' T8/ELEC	1	89		No Upgrade	1	89	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
12	5	Back Area	8	2269	4L4' T8/ELEC	3	330		No Upgrade	3	330	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
13	1	Basement	1	284	3L4' T8/ELEC	2	178		No Upgrade	2	178	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
14	5		1	284	4L4' T8/ELEC	28	3080		No Upgrade	28	3080	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
15	1	Back Area	1	284	3L4' T8/ELEC	7	623		No Upgrade	7	623	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
16	5	Office	8	2269	4L4' T8/ELEC	2	220		No Upgrade	2	220	0	0	\$0.00	\$0.00	OSW	1	125	\$200.00	\$19.97	10.0	\$0.00	\$20.00	125	\$180.00	\$19.97	9.0	
17	6		8	2269	1L4' T8/ELEC	4	124		No Upgrade	4	124	0	0	\$0.00	\$0.00	OSW		70	\$0.00	\$11.25	0.0	\$0.00	\$0.00	70	\$0.00	\$11.25	0.0	
18	1	Office	8	2269	3L4' T8/ELEC	3	267		No Upgrade	3	267	0	0	\$0.00	\$0.00	OSW	1	151	\$200.00	\$24.23	8.3	\$0.00	\$20.00	151	\$180.00	\$24.23	7.4	
19	2	Restroom	8	2269	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			
20	5	Conference Room	6	1702	4L4' T8/ELEC	4	440		No Upgrade	4	440	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			
21	2	Office	8	2269	2L4' T8/ELEC	2	122		No Upgrade	2	122	0	0	\$0.00	\$0.00			0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00			

Seq. #	Upgrade Code	Room/Area	Hrs/ Work Day	Hrs/ Year	Existing			Proposed			KW Reduction	Lighting			Occupancy Sensors (ONLY)				SmartStart Rebate		Lighting & Occupancy Sensors							
					Fixture	Qty.	Watts	Foot Candles	Fixture	Qty.		Watts	Energy Savings, kWh	Cost (\$)	Savings (\$)	Payback (yrs)	Type	Qty.	Energy Savings, kWh	Cost (\$)	Savings (\$)	Payback (yrs)	Lighting	Sensors	Energy Savings, kWh	Post-Rebate Cost (\$)	Savings (\$)	Payback (yrs)
22	1	Entrance Office	8	2269	3L4' T8/ELEC	1	89	No Upgrade	1	89	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
23	1	Entrance Office	8	2269	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
24	1	Elevator Foyer	6	1702	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
25	2	Elevator	24	6807	2L4' T8/ELEC	2	122	No Upgrade	2	122	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
26	1	Mer's Room	12	3404	3L4' T8/ELEC	3	267	No Upgrade	3	267	0	0	\$0.00	\$0.00	OSR	1	227	\$260.00	\$36.35	7.2	\$0.00	\$105.00	227	\$155.00	\$36.35	4.3		
27	1	Back Foyer	8	2269	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
28	1	Women's Room	12	3404	3L4' T8/ELEC	3	267	No Upgrade	3	267	0	0	\$0.00	\$0.00	OSR	1	227	\$260.00	\$36.35	7.2	\$0.00	\$105.00	227	\$155.00	\$36.35	4.3		
29	1	Basement	8	2269	3L4' T8/ELEC	20	1780	No Upgrade	20	1780	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
30	7	Exit signs	24	8760	LED	12	24	No Upgrade	12	24	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
31	1	Library Attic	8	2269	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
32	2		8	2269	2L4' T8/ELEC	2	122	No Upgrade	2	122	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
33	1	Senior-Center Entry	15	4255	3L4' T8/ELEC	3	267	No Upgrade	3	267	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
34	1	Mens	12	3404	3L4' T8/ELEC	3	267	No Upgrade	3	267	0	0	\$0.00	\$0.00	OSR	1	227	\$260.00	\$36.35	7.2	\$0.00	\$105.00	227	\$155.00	\$36.35	4.3		
35	8	Reception	2	567	(2) 9W CFAHW	2	44	No Upgrade	2	44	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
36	1		2	567	3L4' T8/ELEC	3	267	No Upgrade	3	267	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
37	1	Community Room	8	2269	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
38	4	Kitchen	6	1702	(2) 13W CFAHW	5	150	No Upgrade	5	150	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
39	1		6	1702	3L4' T8/ELEC	6	534	No Upgrade	6	534	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
40	1	Closet	1	284	3L4' T8/ELEC	1	89	No Upgrade	1	89	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
41	1	Rear Hall	8	2269	3L4' T8/ELEC	3	267	No Upgrade	3	267	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
42	2		8	2269	2L4' T8/ELEC	1	61	No Upgrade	1	61	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
43	1	Nutrition	2	567	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
44	3		8	2269	2L22"	1	62	No Upgrade	1	62	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
45	1	Comp/Game Room	6	1702	3L4' T8/ELEC	15	1335	No Upgrade	15	1335	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
46	1	Closet Day Senior	1	284	3L4' T8/ELEC	1	89	No Upgrade	1	89	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
47	1	Closet Night Senior	1	284	3L4' T8/ELEC	1	89	No Upgrade	1	89	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
48	1	Redevelopment	6	1702	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
49	3	Entry	8	2269	2L22"	1	62	No Upgrade	1	62	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
50	1	Office for Disabled	4	1135	3L4' T8/ELEC	6	534	No Upgrade	6	534	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
51	1	Equipment	8	2269	3L4' T8/ELEC	6	534	No Upgrade	6	534	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
52	1	Office	8	2269	3L4' T8/ELEC	6	534	No Upgrade	6	534	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
53	1	Front Office	8	2269	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
54	1	Hall Entrance Side	8	2269	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
55	1	Stairs	16	4538	3L4' T8/ELEC	5	445	No Upgrade	5	445	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
56	3		16	4538	2L22"	1	62	No Upgrade	1	62	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
57	1	Upstairs Hall	9	2553	3L4' T8/ELEC	3	267	No Upgrade	3	267	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
58	1	Room A	7	1985	3L4' T8/ELEC	4	356	No Upgrade	4	356	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
59	5	Rear	7	1985	4L4' T8/ELEC	4	440	No Upgrade	4	440	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
60	1	Room B	7	1985	3L4' T8/ELEC	4	356	No Upgrade	4	356	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
61	1	Rear	7	1985	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
62	1	Rear Hall	7	1985	3L4' T8/ELEC	2	178	No Upgrade	2	178	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
63	1	Restroom	1	284	3L4' T8/ELEC	1	89	No Upgrade	1	89	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
64	1	Storage	2	567	3L4' T8/ELEC	4	356	No Upgrade	4	356	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
65	2	Crawl Space	1	284	2L4' T8/ELEC	20	1220	No Upgrade	20	1220	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
66		Outside Entry																										
67	9		7	1985	70W MH/BALLAS	94	8930	No Upgrade	94	8930	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			
68	10		7	1985	85W INCANDESC	26	2210	26W CF	26	728	1,482	2942	\$390.00	\$470.79	0.8	0	\$0.00	\$0.00	\$0.00	\$0.00	2942	\$390.00	\$470.79	0.8	0.8			
69	11		7	1985	26W CFSI	1	28	No Upgrade	1	28	0	0	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00			

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

Third Party Electric Suppliers for PSEG Service Territory	Telephone & Web Site	Third Party Gas Suppliers for Elizabethtown Gas Co. Service Territory	Telephone & Web Site
<b>Hess Corporation</b> 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 <a href="http://www.hess.com">www.hess.com</a>	<b>Cooperative Industries</b> 412-420 Washington Avenue Belleville, NJ 07109	(800) 628-9427 <a href="http://www.cooperativenet.com">www.cooperativenet.com</a>
<b>American Powernet Management, LP</b> 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 <a href="http://www.americampowernet.com">www.americampowernet.com</a>	<b>Direct Energy Services, LLC</b> 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 <a href="http://www.directenergy.com">www.directenergy.com</a>
<b>BOC Energy Services, Inc.</b> 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 <a href="http://www.boc.com">www.boc.com</a>	<b>Gateway Energy Services Corp.</b> 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 <a href="http://www.gesc.com">www.gesc.com</a>
<b>Commerce Energy, Inc.</b> 4400 Route 9 South, Suite 100 Freehold, NJ 07728	(800) 556-8457 <a href="http://www.commerceenergy.com">www.commerceenergy.com</a>	<b>UGI Energy Services, Inc.</b> 704 East Main Street, Suite 1 Moorestown, NJ 08057	(856) 273-9995 <a href="http://www.ugienergyservices.com">www.ugienergyservices.com</a>
<b>ConEdison Solutions</b> 535 State Highway 38 Cherry Hill, NJ 08002	(888) 665-0955 <a href="http://www.conedsolutions.com">www.conedsolutions.com</a>	<b>Great Eastern Energy</b> 116 Village Riva, Suite 200 Princeton, NJ 08540	(888) 651-4121 <a href="http://www.greateastern.com">www.greateastern.com</a>
<b>Constellation New Energy, Inc.</b> 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 <a href="http://www.newenergy.com">www.newenergy.com</a>	<b>Glacial Energy of New Jersey, Inc.</b> 207 LaRoche Avenue Harrington Park, NJ 07640	(877) 569-2841 <a href="http://www.glacialenergy.com">www.glacialenergy.com</a>
<b>Credit Suisse, (USA) Inc.</b> 700 College Road East Princeton, NJ 08450	(212) 538-3124 <a href="http://www.creditsuisse.com">www.creditsuisse.com</a>	<b>Hess Corporation</b> 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 <a href="http://www.hess.com">www.hess.com</a>
<b>Direct Energy Services, LLC</b> 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 <a href="http://www.directenergy.com">www.directenergy.com</a>	<b>Intelligent Energy</b> 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	(800) 724-1880 <a href="http://www.intelligentenergy.org">www.intelligentenergy.org</a>
<b>FirstEnergy Solutions</b> 300 Madison Avenue Morristown, NJ 07926	(800) 977-0500 <a href="http://www.fes.com">www.fes.com</a>	<b>Metromedia Energy, Inc.</b> 6 Industrial Way Eatontown, NJ 07724	(877) 750-7046 <a href="http://www.metromediaenergy.com">www.metromediaenergy.com</a>
<b>Glacial Energy of New Jersey, Inc.</b> 207 LaRoche Avenue Harrington Park, NJ 07640	(877) 569-2841 <a href="http://www.glacialenergy.com">www.glacialenergy.com</a>	<b>MxEnergy, Inc.</b> 510 Thornall Street, Suite 270 Edison, NJ 08837	(800) 375-1277 <a href="http://www.mxenergy.com">www.mxenergy.com</a>
<b>Metro Energy Group, LLC</b> 14 Washington Place Hackensack, NJ 07601	(888) 536-3876 <a href="http://www.metroenergy.com">www.metroenergy.com</a>	<b>NATGASCO (Mitchell Supreme)</b> 532 Freeman Street Orange, NJ 07050	(800) 840-4427 <a href="http://www.natgasco.com">www.natgasco.com</a>
<b>Integrus Energy Services, Inc.</b> 99 Wood Ave. South, Suite 802 Iselin, NJ 08830	(877) 763-9977 <a href="http://www.integrusenergy.com">www.integrusenergy.com</a>	<b>Pepco Energy Services, Inc.</b> 112 Main Street Lebanon, NJ 08833	(800) 363-7499 <a href="http://www.pepco-services.com">www.pepco-services.com</a>
<b>Liberty Power Delaware, LLC</b> Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866) 769-3799 <a href="http://www.libertypowercorp.com">www.libertypowercorp.com</a>	<b>PPL EnergyPlus, LLC</b> 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 <a href="http://www.pplenergyplus.com">www.pplenergyplus.com</a>
<b>Liberty Power Holdings, LLC</b> Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(800) 363-7499 <a href="http://www.libertypowercorp.com">www.libertypowercorp.com</a>	<b>South Jersey Energy Company</b> One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 <a href="http://www.southjerseyenergy.com">www.southjerseyenergy.com</a>
<b>Pepco Energy Services, Inc.</b> 112 Main St. Lebanon, NJ 08833	(800) 363-7499 <a href="http://www.pepco-services.com">www.pepco-services.com</a>	<b>Sprague Energy Corp.</b> 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 <a href="http://www.spragueenergy.com">www.spragueenergy.com</a>
<b>PPL EnergyPlus, LLC</b> 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 <a href="http://www.pplenergyplus.com">www.pplenergyplus.com</a>	<b>Woodruff Energy</b> 73 Water Street Bridgeton, NJ 08302	(800) 557-1121 <a href="http://www.woodruffenergy.com">www.woodruffenergy.com</a>
<b>Sempra Energy Solutions</b> 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 <a href="http://www.semprasolutions.com">www.semprasolutions.com</a>		
<b>South Jersey Energy Company</b> One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 <a href="http://www.southjerseyenergy.com">www.southjerseyenergy.com</a>		
<b>Sprague Energy Corp.</b> 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 <a href="http://www.spragueenergy.com">www.spragueenergy.com</a>		
<b>Strategic Energy, LLC</b> 55 Madison Avenue, Suite 400 Morristown, NJ 07960	(888) 925-9115 <a href="http://www.sel.com">www.sel.com</a>		
<b>Suez Energy Resources NA, Inc.</b> 333 Thornall Street, 6th Floor Edison, NJ 08837	(888) 644-1014 <a href="http://www.suezenergyresources.com">www.suezenergyresources.com</a>		
<b>UGI Energy Services, Inc.</b> 704 East Main Street, Suite 1 Moorestown, NJ 08057	(856) 273-9995 <a href="http://www.ugienergyservices.com">www.ugienergyservices.com</a>		