Steven Winter Associates, Inc.
Architects and Engineers

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

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

June 17, 2010

Local Government Energy Program
Energy Audit Report

Middletown Township
Johnson Gill Annex
1 Kings Highway
Middletown, NJ 07748

Project Number: LGEA41

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INTRODUCTION

On November 23, 2009 and December 8, 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 Johnson Gill Annex. The building is located at 1 Kings Highway, Middletown, New Jersey 07748, in Monmouth 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 1984. The building has a total area of 11,875 square feet. The Johnson-Gill Annex houses the community development offices, construction official, zoning, financial administrative offices, and tax assessor's office. The building is open from 8:00 AM to 5:00 PM Monday through Friday and is occupied by approximately 64 employees.

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/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 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 Johnson Gill Annex Building, located at 1 Kings Highway, Middletown, New Jersey 07748.

Based on the field visits performed by SWA/BSG-PMK staff on November 23, 2009 and December 8, 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 232,240 kWh of electricity for a total cost of $39,052, and this building does not consume natural gas.

With electricity the building consumed 801 MMBtus of energy at a total cost of $39,052.

SWA/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 67 kBtu/sq.ft/year. 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). SWA/BSG-PMK encourages the Township of Middletown 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 was determined to be 49.

(Refer to Section 1.3 for Energy Star Rating)

Category I Recommendations: Capital Improvement Measures

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

Category II Recommendations: Operations and Maintenance

- Replace all exterior door weather stripping.
- Repair/refasten all gutter heat trace and test for continuity.

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

At this time, SWA/BSG-PMK highly recommends a total of **5** Energy Conservation Measures (ECMs) for the Annex that is summarized in the following tables. The total investment cost for this ECM is **$51,945**. SWA/BSG-PMK estimate a first year savings of **$16,541** with a simple payback of **3.1 years**. SWA/BSG-

PMK estimate that implementing the highly recommended ECMs will reduce the carbon footprint of the building by **134,305 lbs of CO_2**, which is equivalent to removing approximately 11 cars from the roads each year.

There are various incentives that the Township of Middletown could apply for that could also help lower the cost of installing the ECMs. SWA/BSG-PMK recommend that the Township 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 82.9 kW.

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

ROI: Return on Investment (%)

Assumptions:

Discount rate:	3.2%	per DOE FEMP guidelines	Electricity rate	$0.17	$/kWh
Energy price escalation rate:	0%	per DOE FEMP guidelines	Gas rate	$1.50	$/therm (state average)

Avg. Annual Demand: 0.003193 Area of Building (SF) 11,875

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 Upgrades	Empirical Data	$13,470	$2,345	$11,125	19,601	5.22	0	5.63	$0	$3,332	15	$39,210	3.34	1683%	112%	29%	$28,655	26,854
2	Convert Rooftop Heat Pumps to Natural Gas	RS Means CostWorks 2009	$61,000	$48,800	$12,200	91,025	24.22	-3,576	-3.96	$0	$10,111	15	$118,971	1.21	5835%	389%	83%	$108,499	82,867
3	Vending Machine Occupancy Sensors	Similar Projects	$500	$0	$500	1,610	0.43	0	0.46	$0	$274	10	$2,311	1.83	3622%	362%	54%	$1,835	2,206
4	Window Film	Contractor	$3,160	$0	$3,160	709	0.19	351	3.16	$0	$648	10	$5,468	4.88	731%	73%	16%	$2,365	5,083
TOTAL			$78,130	$51,145	$26,985	112,945	30.05	-3,224	5.30	$0.00	$14,364	-	$165,961	1.88	-	-	-	$141,353	117,009

Table 2 - Recommended Extended Payback ECMs

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings, $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO_2 Reduced, lbs/yr
5	Building Automation System for Night Setback	Similar Projects	$25,000	$0	$25,000	7,576	2.02	647	7.63	$0	$2,259	15	$26,582	11.07	42%	3%	4%	1,968	17,954
TOTAL			$25,000	$0	$25,000	7,576	2.0	647	7.63	$0.00	$2,259	-	$26,582	11.07	-	-	-	1,968	17,954

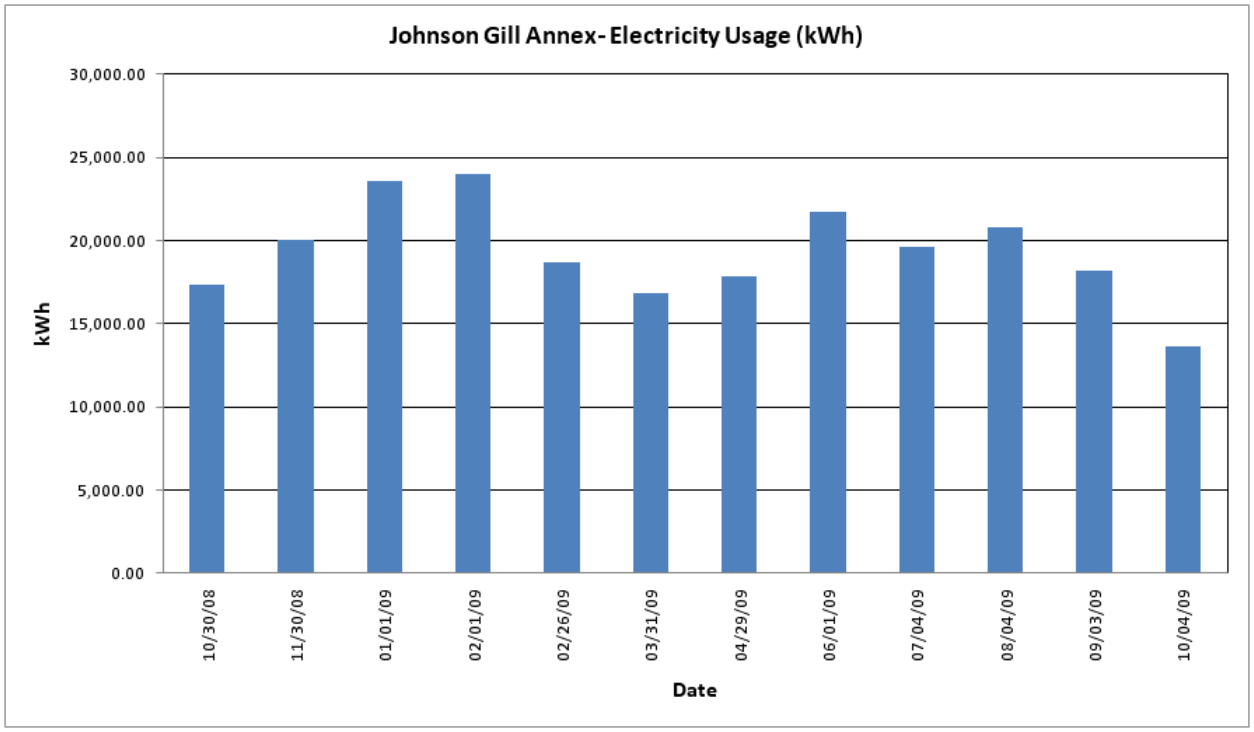
1. HISTORIC ENERGY CONSUMPTION

1.1 Energy Usage and Cost Analysis

SWA/BSG-PMK analyzed utility bills from November, 2007 through October, 2009 that were received from the utility companies supplying the Johnson Gill Annex with electricity. There is no natural gas consumed at this facility.

Electricity - The Johnson Gill Annex is currently served by one electric meter and receives 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 consumed **232,240 kWh or $39,052 worth of electricity** during that time span.

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



1.2 Utility Rate

The Johnson Gill Annex currently receives 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 October, 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. SWA/BSG-PMK recommend that the Township maintain the Portfolio Manager account at the link below. As the account is maintained, SWA/BSG-PMK has shared with the Township and allow future data to be added and tracked using the benchmarking tool. SWA has also shared this information with TRC.

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

Username: middletowntownship
Password: middletown

Buildings achieving an Energy Star rating of 75 are eligible to apply for the Energy Star award and receive the Energy Star plaque to convey superior performance. These ratings also greatly help when applying for Leadership in Energy and Environmental Design (LEED) building certification through the United States Green Building Council (USGBC). The Johnson Gill Annex received an energy performance rating of 49. SWA/BSG-PMK encourages the Township to continue entering utility data in Energy Star Portfolio Manager in order to track whether normalized source energy use over time.

The Site Energy Use Intensity is 67 kBtu/ft^{2}yr compared to the national average of 67 kBtu/ft^{2}yr for commercial buildings classified similarly by the Energy Star Portfolio Manager. Implementing this report's recommendations will reduce use by approximately 12.8 kBtu/ft^{2}yr, which when implemented would lower the buildings energy consumption.

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Johnson Gill Annex

Building ID: 2062033
For 12-month Period Ending: September 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: February 17, 2010

Facility	Facility Owner	Primary Contact for this Facility
Johnson Gill Annex 1 King's Hwy Middletown, NJ 07748	Middletown Township 1 Kings Highway Middletown, NJ 07749	Jason Greenspan 1 King's Highway Middletown, NJ 07737

Year Built: 1984
Gross Floor Area (ft²): 11,875

Energy Performance Rating[2] (1-100) 49

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	801,490
Natural Gas - (kBtu)[4]	0
Total Energy (kBtu)	801,490

Energy Intensity[5]	
Site (kBtu/ft²/yr)	67
Source (kBtu/ft²/yr)	225

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	122

Electric Distribution Utility
FirstEnergy - Jersey Central Power & Lt Co

National Average Comparison	
National Average Site EUI	67
National Average Source EUI	225
% Difference from National Average Source EUI	0%
Building Type	Office

Stamp of Certifying Professional

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

Certifying Professional
N/A

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

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

EPA Form 5900-16

2. FACILITY AND SYSTEMS DESCRIPTION

2.1 Building Characteristics

The Johnson-Gill Annex was built in 1984. The building has a total area of 11,875 square feet. The Johnson-Gill Annex houses the community development offices, construction official, zoning, financial administrative offices, and tax assessor's office.

2.2 Building Occupancy Profiles

The building is open from 8:00 AM to 5:00 PM Monday through Friday and is occupied approximately 64 employees.

2.3 Building Envelope

2.3.1 Exterior Walls

The exterior walls consist of poured concrete foundation wall with windows and a Butler building upper section with a parapet. The type and level of insulation could not be determinedThe walls are in good condition.

2.3.2 Roof

The roof is a metal type roof system. The interlocking panels are fastened to the roof sheathing. The roof is in good condition, however the heat trace for the gutter and leader system was found to be in disrepair. Proper installation and functioning of the heat trace is critical to reducing ice buildup and weight from the roof system.

Category II Recommendations – Operations & Maintenance: Repair/refasten all heat trace and test for continuity.

2.3.3 Base

The base of the building is poured concrete on grade. The concrete base is in fair condition.

2.3.4 Windows

The majority of the building is made up of aluminum storefront with thermal pane clear glass. All are in good condition.

Category III Recommendations - ECM #4: Installation of window film.

2.3.5 Exterior doors

The exterior doors are in good condition. The doors are medium style aluminum frame with glass. The doors have no weather-stripping.

Category II – Operations & Maintenance: Replace all exterior door weather stripping.

2.3.6 Building air tightness

There are no visual signs of outside air infiltration; however, several occupants expressed discomfort related to the heating and air-conditioning.

2.4 HVAC Systems

2.4.1 Heating

Seven electric rooftop heat pumps provide heating and cooling to the facility. An additional split-system condensing unit serves an indoor fan motor in the server room:

Unit #	Description	Manufacturer	Model #	Cooling (Tons)	SEER	Heating (BTUH)
1	Rooftop heat pump	Carrier	50HJQ006---521HQ	5	13	55,000
2	Rooftop heat pump	Carrier	50HJQ006---5521QG	5	13	55,000
3	Rooftop heat pump	Carrier	50HJQ006-521HQ	5	13	55,000
4	Rooftop heat pump	Carrier	50TJQ006-501GA	5	13	55,000
5	Rooftop heat pump	Carrier	50TFQ004-A-511--	3	10.2	34,400
6	Rooftop heat pump	Carrier	50TFQ004-A-511--	3	10.2	34,400
7	Rooftop heat pump	Carrier	50TFQ004-A-511--	3	10.2	34,400
8	Split-system condensing unit	Sanyo	SAP361C	3	11	-

Rooftop Heat Pumps

Category III Recommendation – ECM #2: Convert all seven rooftop heat pumps to natural gas.

2.4.2 Cooling

Cooling is provided by the (7) Carrier roof top units. The roof top units are heat pumps, and were found to be in good condition. The SEER's on all the units were between 10 and 13.

Category II Recommendation – Operations & Maintenance: Install supply and return registers in the director's office, adjacent to the Tax Department.

2.4.3 Ventilation

Ventilation is provided by one exhaust fan, doors, operable windows, and the rooftop units. The ventilation was found to be sufficient for this building

2.4.4 Domestic Hot Water

Hot Water is heated by an electric water heater. The unit was found to be in fair condition.

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 $3,332.21 based on the current $0.17/kWh and the current occupancy schedule. Implementation of this ECM will cost approximately $13,470.00. Currently the Board of Public Utilities (BPU) would offer an estimated rebate of $2,345.00, yielding a net cost of $11,125.00 for this project. With a yearly savings of $3,332.21 the payback on this ECM would about 3.3 years.

Category III Recommendation - ECM #1: Recommend upgrading all T-12 lighting fixtures with magnetic ballasts to T-8 fixtures with electronic ballasts, as well as various other lighting upgrades outlined in Appendix A. The building has lighting sensors installed in bathrooms and some offices.

Refer to Appendix A for further details.

2.5.2 Appliances and process

In the facility, there were twenty-four computers, two refrigerators (Welbilt model number WB/332-3, and another without a model number or manufacturer), a Mr. Coffee coffee maker, a Black & Decker toaster oven, a stove, and two vending machines.

2.5.3 Elevators

There are no elevators in the facility.

2.5.4 Other electrical systems

There are currently no other significant energy impacting electrical systems installed at the Annex.

3. EQUIPMENT LIST

Building System	Description	Location	Model #	Fuel	Space Served	Estimated Remaining Useful Life %
Cooling/ Heating	Unit #1: Roof Top Heat Pump Unit; 5-tons cooling, 13 SEER, 55,000 BTUH electric heat	Roof	Carrier M# 50HJQ006---521HQ	Electric	Entry & Buildings Department	60%
Cooling/ Heating	Unit #5: Roof Top Heat Pump Unit; 3 tons, 10.2 SEER, 34,400 BTUH electric heat	Roof	Carrier M# 50TFQ004-A-511--	Electric	Tax Area	60%
Cooling/ Heating	Unit #6: Roof Top Heat Pump Unit; 3 tons, 10.2 SEER, 34,400 BTUH electric heat	Roof	Carrier M# 50TFQ004-A-511--	Electric	Perimeter Offices	60%
Cooling/ Heating	Unit #2: Roof Top Heat Pump Unit; 5 tons, 13 SEER, 55,000 BTUH electric heat	Roof	Carrier M# 50HJQ006-521QG	Electric	Buildings Department	60%
Cooling/ Heating	Unit #3: Roof Top Heat Pump Unit; 5 tons, 13 SEER, 55,000 BTUH electric heat	Roof	Carrier M# 50HJQ006---521HQ	Electric	North & East Corner Offices	60%
Cooling/ Heating	Unit #4: Roof top heat pump unit; 5 tons, 13 SEER, 55,000 BTUH electric heat	Roof	Carrier M# 50TJQ006-501GA	Electric	Administrator's Office	60%
Cooling/ Heating	Unit #7: Roof Top Heat Pump Unit; 3 tons, 10.2 SEER, 34,400 BTUH electric heat	Roof	Carrier M# 50TFQ004-A-511--	Electric	Tac Collectors' Office	60%
Cooling/ Heating	Split System - Indoor Fan Motor	MIS room (Ceiling)	Sanyo #SAP361R	Electric	Server room	50%
Cooling/ Heating	Split System - 3-ton outdoor condensing unit	Outside	Sanyo #SAP361C	Electric	Server room	50%
Ventilation	Exhaust fan	Roof	Nameplate missing	Electric	Restrooms	40%
Appliance	Stove	Kitchen	GE M# JSP40WDW	Electric	Kitchen	50%
Appliance	Refrigerator	Kitchen	Electrolux M# FRT1783AW9	Electric	Kitchen	50%
Appliance	Stove hood	Kitchen	GE M# 320003WH1	Electric	Stove	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 the Johnson Gill Annex, SWA/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 SWA/BSG-PMK survey, no capital improvement measures are recommended.

Category II Recommendations: Operations and Maintenance

- Replace all exterior door weather stripping.
- Repair/refasten all gutter heat trace and test for continuity.

Category III Recommendations: Energy Conservation Measures

Summary table

ECM #	Description
1	Lighting Upgrades
2	Convert Rooftop Heat Pumps to Natural Gas
3	Vending Machine Occupancy Sensors
4	Window Film
5	Building Automation System for Night Setback

ECM#1: Lighting Upgrades

Description:

Lighting at the Johnson Gill Annex consists primarily of T-12 fluorescent lamps with magnetic ballasts. The building has lighting sensors installed in certain areas. It is recommended that all T-12 fixtures with magnetic ballasts be retrofit with T-8 lamps and electronic ballasts. The exterior lighting consists of H.I.D. pole mounted fixtures in the parking lot. The exterior was also lit with incandescent lamps that 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.

Recommended lighting upgrades are detailed in Appendix A.

Installation cost:

Summary	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
Cost	$13,470.00	$0.00	$13,470.00
Rebate	$2,345.00	$0.00	$2,345.00
Net Cost	$11,125.00	$0.00	**$11,125.00**
Savings (kWh)	19,601	0	**19,601**
Savings ($)	$3,332.21	$0.00	**$3,332.21**
Payback	3.3		**3.3**

Variables:		**Assumptions:**	
$0.17	**Avg. Electric Rate ($/kWh)**	**25%**	**Occupancy Sensor Savings (Avg)**
	Avg. Demand Rate ($/kW)	**40%**	**Occupancy Sensor Savings(>Avg)**
2600	**Operating Hours/Year**		
10	**Operating Hours/Work Day**		

Source of cost estimate: Empirical Data

Economics (without incentives):

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings, $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO_2 Reduced, lbs/yr
1	Lighting Upgrades	Empirical Data	$13,470	$2,345	$11,125	19,601	5.22	0	5.63	$0	$3,332	15	$39,210	3.34	1683%	112%	29%	$28,655	26,854

Assumptions:

The electric cost used in this ECM was $0.17/kWh, which was the Senior Center's average rate for the 12-month period ranging from October, 2008 through October, 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. The total rebate this ECM qualifies for is $2,345.

ECM#2: Convert Rooftop Heat Pumps to Natural Gas

Description:

The Annex is heated & cooled by seven Carrier rooftop heat pumps. The MIS room is cooled by a separate 3-ton Sanyo split-system. All The heat pumps have electric heat, which is much more expensive than gas heat, on a per-therm basis. It is recommended that the heat pumps be replaced with units that have a high Seasonal Energy Efficiency Ratio (SEER) gas heating. Natural gas companies typically do not charge for having gas brought to a building, as long as there is a line nearby. All of the Annex's neighboring buildings are heated by gas.

Installation cost:

Estimated installed cost: (4) 5-ton heat pumps: $10,000 each
(3) 3-ton heat pumps: $7,000 each

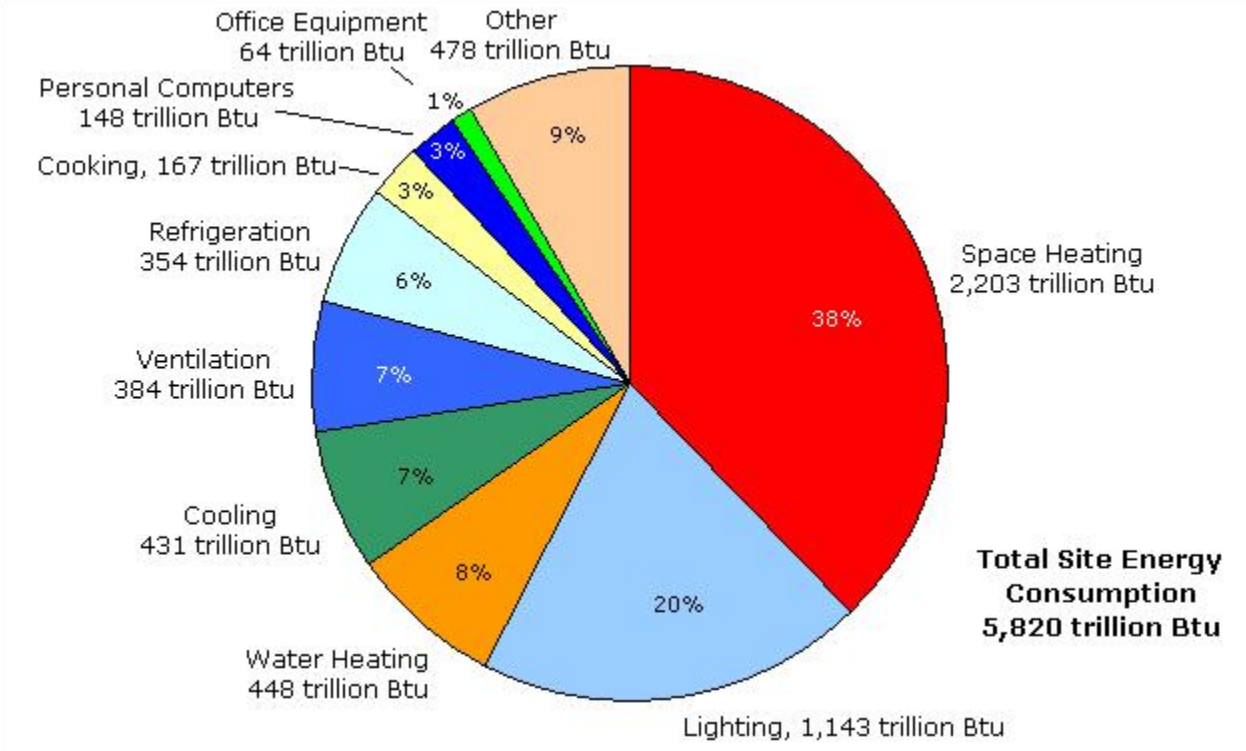
Source of cost estimate: Similar projects, RS Means CostWorks 2009

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	Convert Rooftop Heat Pumps to Natural Gas	RS Means CostWorks 2009	$61,000	$48,800	$12,200	91,025	24.22	-3,576	-3.96	$0	$10,111	15	$118,971	1.21	5835%	389%	83%	$108,499	82,867

Assumptions:

There is currently no natural gas service to the building, therefore the cost of natural gas will be assumed to be about $1.50 per therm. The cost per kWh of electricity at the Annex, taken from twelve months of electric bills, is $0.17. Also taken from the energy bills was the building's total electric consumption during this time period, 232,240 kWh. There are four 5-ton heat pumps that have a SEER of 13, and three 3-ton units that have a SEER of 10.2. The heating capacities of the units are 55 MBH and 34.4 MBH for the 5- and 3-ton units, respectively. Electric heat is be assumed to be 95%. Because there are seven units, the electric consumptions for heating and cooling must be divided between these units. The total heating and cooling consumptions of all units combined must first be estimated. A pie chart from the US Department of Energy, shown below, shows the average percentage of a building's total energy consumption that each system accounts for:



Using these percentages, it is estimated that of the 232,240 kWh of electricity the Annex consumes, 38%, or 88,251 kWh (equivalent to 3,011 therms), was used for heating, and 7%, or 16,257 kWh, was used for cooling. With the total heating and cooling electric consumptions known, the consumptions for each unit can now be calculated. First, the heating consumptions will be calculated. An accurate way to go about this is to add the heating capacities of all seven units, and make the percentage of the total heating consumption that each unit consumed proportional to the percentage of the cumulative heating capacities that each unit represents:

Unit #	BTUH	% of Total	kWh
1	55,000	17.02%	15,018
2	55,000	17.02%	15,018
3	55,000	17.02%	15,018
4	55,000	17.02%	15,018
5	34,400	10.64%	9,393
6	34,400	10.64%	9,393
7	34,400	10.64%	9,393

In this same manner, the cooling consumption for each heat pump could be calculated:

Unit #	Tons	% of Total	kWh
1	5	17.24%	2,803
2	5	17.24%	2,803
3	5	17.24%	2,803
4	5	17.24%	2,803
5	3	10.34%	1,682
6	3	10.34%	1,682
7	3	10.34%	1,682

Efficiencies for new rooftop units will be as high as 80%. The proposed SEER for the 5-ton units is 14.5, and for the 3-ton units, 15. The heating savings can be calculated with the following series of equations:

Current Heating Input: 5-ton units, 15,018 kWh (512 therms) each; 3-ton units, 9,393 kWh each (321 therms)

Heating Input×Current Efficiency=Current/Proposed Heating Output

$$\frac{\text{Heating Output}}{\text{Proposed Efficiency}} = \text{Proposed Heating Input}$$

Current Heating Input - Proposed Heating Input=Savings

The heating savings for upgrading the heat pumps are as follows:

	Heating		Efficiency		Current Input		Heating Output		Proposed Input		Savings		
Unit #	BTUH	% of Total	Current	Proposed	kWh	Therms	kWh	Therms	kWh	Therms	kWh	Therms	$
1	55,000	17.02%	95%	80%	15,018	512	14,267	487	17,834	609	15,018	-609	$1,640.29
2	55,000	17.02%	95%	80%	15,018	512	14,267	487	17,834	609	15,018	-609	$1,640.29
3	55,000	17.02%	95%	80%	15,018	512	14,267	487	17,834	609	15,018	-609	$1,640.29
4	55,000	17.02%	95%	80%	15,018	512	14,267	487	17,834	609	15,018	-609	$1,640.29
5	34,400	10.64%	95%	80%	9,393	321	8,923	304	11,154	381	9,393	-381	$1,025.93
6	34,400	10.64%	95%	80%	9,393	321	8,923	304	11,154	381	9,393	-381	$1,025.93
7	34,400	10.64%	95%	80%	9,393	321	8,923	304	11,154	381	9,393	-381	$1,025.93
Totals	323,200	100.00%	95%	80%	88,251	3,011	83,839	2,861	104,798	3,576	88,251	-3,576	$9,638.92

In this table, the current input, kWh and therms, and the current efficiency are for the electric units, and the proposed input, also in kWh and therms, and the proposed efficiency, are for the gas units. The efficiency is decreased when switching to gas, but the energy cost is also decreased. This yields a substantial monetary savings, but not an energy savings.

The current 5-ton rooftop units have a SEER value of 13, and the 3-ton units have a SEER of 10.2. New rooftop units have SEERs up to 15.5. The cooling savings were calculated by the following series of equations:

Current Electric Input: 5-ton units, 14,267 kWh; 3-ton units, 8,923 kWh

$$\text{Current/Proposed Cooling Output (BTU)} = \text{Current Electric Input (kWh)} \times \text{SEER} \left(\frac{\text{BTU}}{\text{Wh}}\right) \times \frac{1{,}000\ \text{Wh}}{\text{kWh}}$$

$$\text{Proposed Electric Input (kWh)} = \frac{\text{Proposed Cooling Outut (BTU)}}{\text{SEER} \left(\frac{\text{BTU}}{\text{Wh}}\right) \times \frac{1{,}000\ \text{Wh}}{\text{kWh}}}$$

Savings (kWh)=Current Electric Input (kWh)-Proposed Electric Input (kWh)

The cooling savings for upgrading the rooftop units were as follows:

	Cooling		SEER		Current Input/Output		Proposed Input/Output		Savings	
Unit #	Tons	% of Total	Current	Proposed	kWh (in)	BTU (out)	kWh (in)	BTU (out)	kWh	$
1	5	17.24%	13	14.5	2,803	36,437,655	2,513	36,437,655	290	$49.29
2	5	17.24%	13	14.5	2,803	36,437,655	2,513	36,437,655	290	$49.29
3	5	17.24%	13	14.5	2,803	36,437,655	2,513	36,437,655	290	$49.29
4	5	17.24%	13	14.5	2,803	36,437,655	2,513	36,437,655	290	$49.29
5	3	10.34%	10.2	15	1,682	17,153,727	1,144	17,153,727	538	$91.49
6	3	10.34%	10.2	15	1,682	17,153,727	1,144	17,153,727	538	$91.49
7	3	10.34%	10.2	15	1,682	17,153,727	1,144	17,153,727	538	$91.49
Totals	29	100.00%	10.2	15	16,257	165,819,360	11,055	165,819,360	5,202	$884.37

Rebates/financial incentives:

This ECM may be eligible for incentives through New Jersey's Direct Install Program, which can incentivize up to 80% of the total installation cost, which we estimate to be $48,800 for this measure. Please note that these incentive levels are estimates based on SWA's expected project cost and assumption of project eligibility. Actual incentive levels and project eligibility can only be determined through an Energy Assessment performed by a Direct Install Contractor.

ECM#3: Vend Misers

Description:

The average vending machine consumes 4,025 kWh of energy per year, most of which can be attributed to lighting and cooling, which run 24 hours-per-day. Installing vend misers on Annex's two vending machines would activate the power to the vending machines when in use, and deactivate the power to the power and lights if the vending machines have not been used for more than 15 minutes. Vending machine lighting would remain off until the adjacent area is occupied again. The refrigeration will be shut down for a maximum of two hours, in order to maintain a desirable temperature for the product.

Installation cost: $250 each, $500 total
Source of cost estimate: Similar Projects

Economics:

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings, $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO2 Reduced, lbs/yr
3	Vending Machine Occupancy Sensors	Similar Projects	$500	$0	$500	1,610	0.43	0	0.46	$0	$274	10	$2,311	1.83	3622%	362%	54%	$1,835	2,206

Assumptions:

The electric cost used in this ECM was $0.17/kWh, which was the Annex's average rate for the 12-month period ranging from October, 2008 through October, 2009. The average vending machine consumes 4,025 kWh per year. Energy savings for a vending machine in low-occupancy (under 68 hours per week) areas is about 40%.

Rebates/financial incentives:

No rebates or incentives for vending machine occupancy sensors could be found.

ECM#4: Window Film

Description:

A high percentage of the Annex's wall area is made entirely from windows. During SWA/BSG-PMK's survey of the facility, employees noted a problem with the building being too hot in the summer, due to solar radiation, and too cold in the winter, due to escaping heat through the windows. It is recommended that the windows be fitted with a radiation resistant film. A clear film is available that resists 65% of total heat in the summer and keeps 38% of escaping heat inside the building in the winter. The result is a 12-18% savings in heating and cooling costs.

Installation cost: $3,159.65 @ $2.50 per square foot
Source of cost estimate: Contractor

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
4	Window Film	Contractor	$3,160	$0	$3,160	709	0.19	351	3.16	$0	$648	10	$5,468	4.88	731%	73%	16%	$2,365	5,083

Assumptions:

The cost of electricity purchased for the Annex between October, 2008 and October, 2009 was $0.17/kWh. After the implementation of ECM #2, converting the heat pumps to natural gas, and ECM #5, installing a building automation system, the annual heating consumption of the building will be 2,929 therms of natural gas and the annual cooling consumption will be 5,906 kWh of electricity. Installing the film will result in a minimum 12% additional savings in heating and cooling costs.

Rebates/financial incentives:

No rebates or incentives window film could be found.

ECM #5: Building Automation System for Night Setback

Description:

The Annex's manual, dial temperature controls do not have a night setback system, which means that the heating and cooling would not be lowered automatically when the building is not in use. A building automation system would have a similar effect as setback thermostats: the temperature would be adjusted automatically when the facility is not in use, and save energy by not causing excess heating and cooling to be used when the building is unoccupied.

Installation cost:

Estimated installed cost: $25,000
Source of cost estimate: Similar projects

Economics:

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings, $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO2 Reduced, lbs/yr
5	Building Automation System for Night Setback	Similar Projects	$25,000	$0	$25,000	7,576	2.02	647	7.63	$0	$2,259	15	$26,582	11.07	42%	3%	4%	1,968	17,954

Assumptions:

The electric cost, taken from 12 months of electric bills, is $0.17/kWh. There is currently no natural gas service to the building, therefore the cost of natural gas will be assumed to be about $1.50 per therm For the heating season, the occupied and unoccupied temperatures were assumed to be 68°F and 60°F, respectively. For the cooling season, these temperatures were assumed to be 72°F and 86°F, respectively. Using heating and electrical bills, the total heating and cooling consumptions, after the conversion from electric to gas heat in ECM #2, were calculated to be 3,576 therms of natural gas and 13,483 kWh of electricity, respectively. The average hours of setback for the three buildings were estimated to be 12 hours every night, 12 hours every day on weekends, and 2 hours every day on weekdays. Due to the fact that the savings come from setting the temperature back, much like a programmable thermostat, the savings were calculated using Honeywell's Commercial Programmable Thermostat Energy Savings Calculator, an Excel spreadsheet, which assumes 3% savings per degree of setback for the heating season, and 6% for the cooling season.

Rebates/financial incentives:

No rebates or incentives for building automation systems could be found.

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 cost beneficial to this project since there is such a small area of viable space available and the building is not orientated properly for PV.

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.

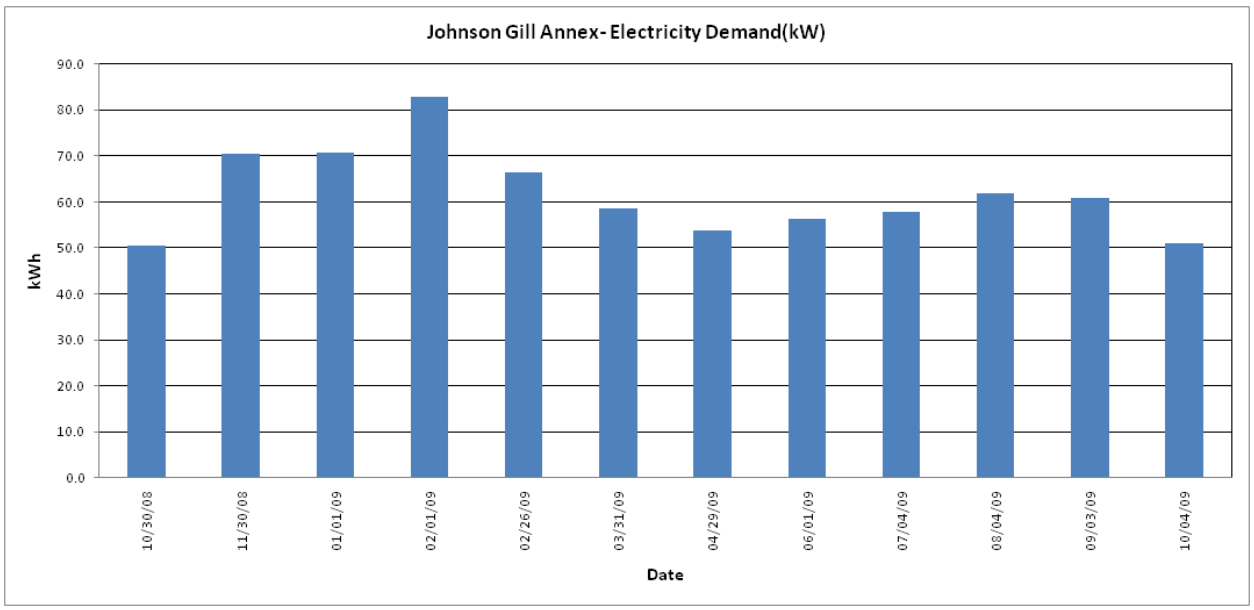
5.6 Wind

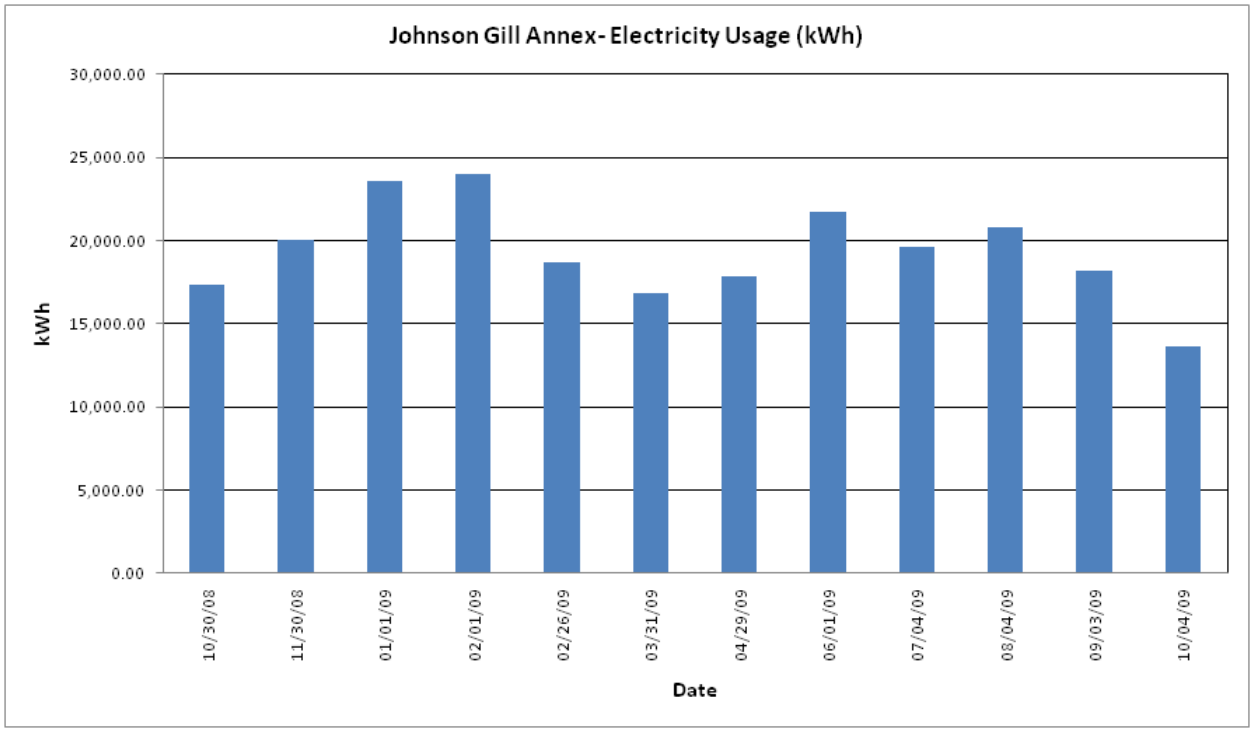
Wind power production is not appropriate for this location because required land is not available for the wind turbine. Also, the available wind energy resource is very low.

6. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

6.1 Load profiles

The average electrical peak demand for the facility during previous year was 61.8 kW and the maximum peak demand was 82.9 kW. The electric load profile for this project is presented in the following charts. The Johnson Gill Annex does not consume natural gas. The first chart shows the electric demand (in kW) for the previous 12 months and the next chart shows electric usage (in kWh).



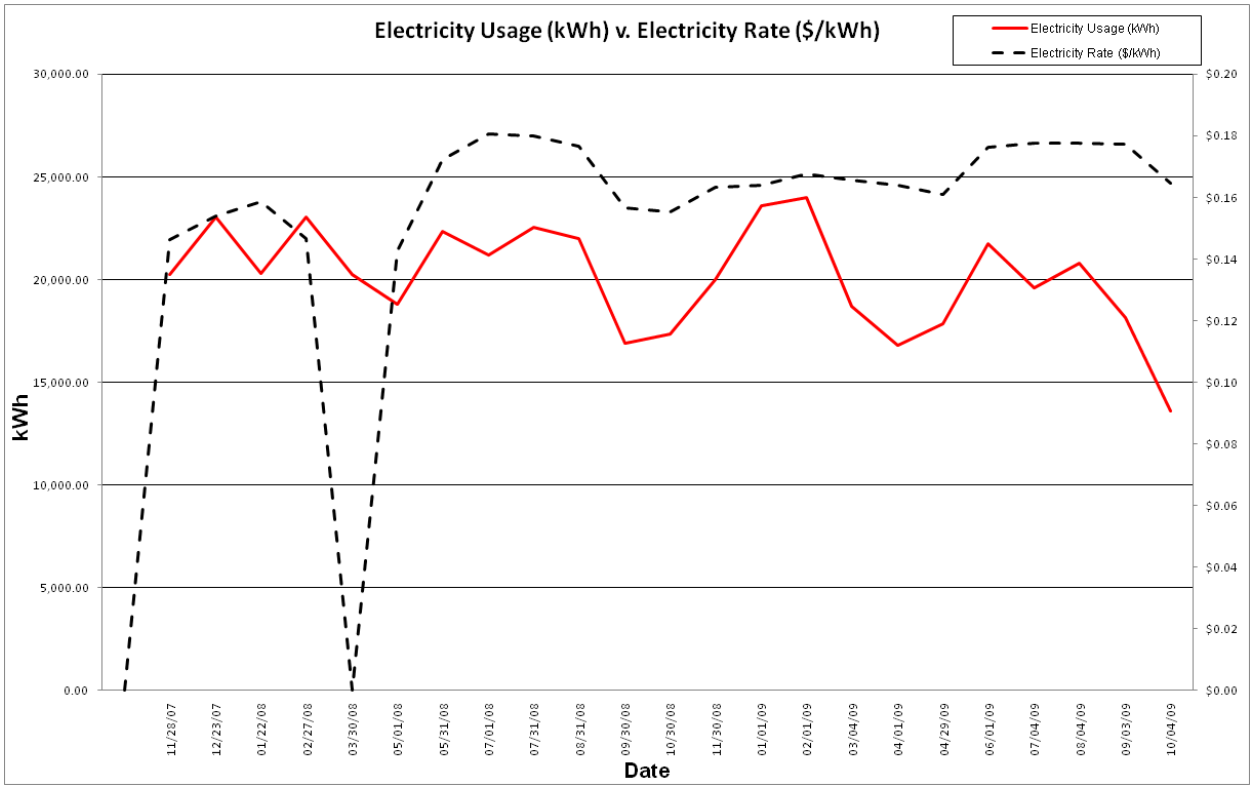


6.2 Energy Procurement strategies

Billing analysis shows price fluctuations of over 20% over the course of the year for the building's electrical and natural gas accounts. This may be reflective of the utility tariffs under which the building owner secures its' energy supply. These tariffs often include seasonally adjusted demand charges, or seasonally adjusted usage charges which reflect the markets for the underlying energy commodity. For example a utility often has tariffs which charge more for electricity in the summer when demand for capacity is high and, the marginal producer of electricity is a higher cost generator who otherwise would not be running in the winter, or shoulder seasons.

Buildings which have a large variation in monthly billing rates can often reduce the costs associated with energy procurement by selecting a third party energy supplier who can provide them with fixed pricing over the course of a contract term as well as attain purchasing economies which may not be available on a utilities default tariff (basic generation service in the case of electric and basic gas service in the case of natural gas).

Currently, New Jersey commercial buildings of similar type pay $0.15/kWh for electricity The electricity rate for the building is $.17/kWh, which means there is a potential cost savings of $4,216 per year. A small cost savings potential for electricity exists, however this involves contacting third party suppliers and negotiating utility rates. SWA recommends that Middletown contact the NJ Energy Choice Program for further information on companies that can act as third party (non-utility) energy suppliers. Purchasing energy from a third party supplier can reduce price fluctuations and can ultimately reduce the annual cost of energy for the facility. Appendix B contains a complete list of third party energy suppliers.



Electricity prices generally reflect electricity usage (March electricity rate data was missing)

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

Middletown Township
Johnson Gill Annex
1 Kings Highway

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	(4) 4' 34W T12 Lamps, Magnetic Ballasts / Retrofit with T8 Lamps, Electronic Ballast	4L4' EE/STD	160	4L4' T8/ELEC	110	135	$90.00	$15.00
2	Incandescent Exit Sign / Retrofit with LEDs	15W Exit	15	LED	2	8	$40.00	$10.00
3	(2) 34W T12 U-Tube Lamps, Magnetic Ballast / Retrofit with T8 U-Tube Lamps, Electronic Ballast	2L22" STD/STD	94	2L22"	62	16	$60.00	$15.00
4	70W Metal Halide Fixture / No Upgrade	70W MH/BALLAST	95	No Upgrade	95	7	$0.00	$0.00
5	(1) 20W T12 Lamp, Magnetic Ballast / Retrofit with T8 Lamp, Electronic Ballast	(1) F20T12/HPFMAG	32	(1) FO17T8/EEMAG	24	3	$0.00	$0.00
6	75W Halogen	75W HALOGEN	75	26W CF/SI	28	4	$10.00	$0.00
7						0	$0.00	$0.00
8						0	$0.00	$0.00
9						0	$0.00	$0.00
10						0	$0.00	$0.00
11						0	$0.00	$0.00
12						0	$0.00	$0.00

Summary

	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
Cost	$13,470.00	$0.00	$13,470.00
Rebate	$2,345.00	$0.00	$2,345.00
Net Cost	$11,125.00	$0.00	**$11,125.00**
Savings (kWh)	19,601	0	**19,601**
Savings ($)	$3,332.21	$0.00	**$3,332.21**
Payback	3.3		**3.3**

Variables:

$0.17	Avg. Electric Rate ($/kWh)
	Avg. Demand Rate ($/kW)
2600	Operating Hours/Year
10	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:					24265				16707	7.578	19601	$13,470.00	$3,332.21	4.0			0	$0.00	$0.00		$2,345.00	$0.00	19601	$11,125.00	$3,332.21	3.3
1	1	Community Dev.	8	2080	4L4' EE/STD	16	2560		4L4' T8/ELEC	16	1760	0.8	1664	$1,440.00	$282.88	5.1			0	$0.00	$0.00		$240.00	$0.00	1664	$1,200.00	$282.88	4.2
2	2	Community Dev.	8	2080	15W Exit	1	15		LED	1	2	0.013	27	$40.00	$4.60	8.7			0	$0.00	$0.00		$10.00	$0.00	27	$30.00	$4.60	6.5
3	1	Office	8	2080	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	208	$180.00	$35.36	5.1			0	$0.00	$0.00		$30.00	$0.00	208	$150.00	$35.36	4.2
4	1	Office	8	2080	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	208	$180.00	$35.36	5.1			0	$0.00	$0.00		$30.00	$0.00	208	$150.00	$35.36	4.2
5	1	Bldg Sub Code	8	2080	4L4' EE/STD	4	640		4L4' T8/ELEC	4	440	0.2	416	$360.00	$70.72	5.1			0	$0.00	$0.00		$60.00	$0.00	416	$300.00	$70.72	4.2
6	1	Office (storage)	8	2080	4L4' EE/STD	1	160		4L4' T8/ELEC	1	110	0.05	104	$90.00	$17.68	5.1			0	$0.00	$0.00		$15.00	$0.00	104	$75.00	$17.68	4.2
7	1	Office	8	2080	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	208	$180.00	$35.36	5.1			0	$0.00	$0.00		$30.00	$0.00	208	$150.00	$35.36	4.2
8	2	Office	8	2080	15W Exit	1	15		LED	1	2	0.013	27	$40.00	$4.60	8.7			0	$0.00	$0.00		$10.00	$0.00	27	$30.00	$4.60	6.5
9	3	Back Vestibule	8	2080	2L22" STD/STD	1	94		2L22"	1	62	0.032	67	$60.00	$11.32	5.3			0	$0.00	$0.00		$15.00	$0.00	67	$45.00	$11.32	4.0
10	1	Main Office Area	12	3120	4L4' EE/STD	34	5440		4L4' T8/ELEC	34	3740	1.7	5304	$3,060.00	$901.68	3.4			0	$0.00	$0.00		$510.00	$0.00	5304	$2,550.00	$901.68	2.8
11	1	Construction official	8	2080	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	208	$180.00	$35.36	5.1			0	$0.00	$0.00		$30.00	$0.00	208	$150.00	$35.36	4.2
12	2	Construction official	8	2080	15W Exit	1	15		LED	1	2	0.013	27	$40.00	$4.60	8.7			0	$0.00	$0.00		$10.00	$0.00	27	$30.00	$4.60	6.5
13	1	Zoning Officer	8	2080	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	208	$180.00	$35.36	5.1			0	$0.00	$0.00		$30.00	$0.00	208	$150.00	$35.36	4.2
14	4	Lobby	14	3640	70W MH/BALLAS	7	665		No Upgrade	7	665	0	0	$0.00	$0.00				0	$0.00	$0.00		$0.00	$0.00	0	$0.00	$0.00	
15	2	Exit	24	8760	15W Exit	1	15		LED	1	2	0.013	114	$40.00	$19.36	2.1			0	$0.00	$0.00		$10.00	$0.00	114	$30.00	$19.36	1.5
16	3	Men's Room	12	3120	2L22" STD/STD	1	94		2L22"	1	62	0.032	100	$60.00	$16.97	3.5			0	$0.00	$0.00		$15.00	$0.00	100	$45.00	$16.97	2.7
17	5	Men's Room	12	3120	(1) F20T12/HPFM	1	32		(1) FO17T8/EEMA	1	24	0.008	25	$0.00	$4.24	0.0			0	$0.00	$0.00		$0.00	$0.00	25	$0.00	$4.24	0.0
18		Closet (Locked)	0.5	130															0	$0.00	$0.00			$0.00				
19		Equipment Closet (Locked)	1	260															0	$0.00	$0.00			$0.00				
20	3	Women's Room	12	3120	2L22" STD/STD	1	94		2L22"	1	62	0.032	100	$60.00	$16.97	3.5			0	$0.00	$0.00		$15.00	$0.00	100	$45.00	$16.97	2.7
21	5	Women's Room	12	3120	(1) F20T12/HPFM	2	64		(1) FO17T8/EEMA	2	48	0.016	50	$0.00	$8.49	0.0			0	$0.00	$0.00		$0.00	$0.00	50	$0.00	$8.49	0.0
22	1	Employee Lounge	10	2600	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	260	$180.00	$44.20	4.1			0	$0.00	$0.00		$30.00	$0.00	260	$150.00	$44.20	3.4
23	1	Conference	5	1300	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	130	$180.00	$22.10	8.1			0	$0.00	$0.00		$30.00	$0.00	130	$150.00	$22.10	6.8
24	3	Office of Central Purchasing	8	2080	2L22" STD/STD	12	1128		2L22"	12	744	0.384	799	$720.00	$135.78	5.3			0	$0.00	$0.00		$180.00	$0.00	799	$540.00	$135.78	4.0
25	1	Office	8	2080	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	208	$180.00	$35.36	5.1			0	$0.00	$0.00		$30.00	$0.00	208	$150.00	$35.36	4.2
26	3	Vestibule	8	2080	2L22" STD/STD	1	94		2L22"	1	62	0.032	67	$60.00	$11.32	5.3			0	$0.00	$0.00		$15.00	$0.00	67	$45.00	$11.32	4.0
27	2	Exit	24	8760	15W Exit	2	30		LED	2	4	0.026	228	$80.00	$38.72	2.1			0	$0.00	$0.00		$20.00	$0.00	228	$60.00	$38.72	1.5
28	1	Tax Assessment	8	2080	4L4' EE/STD	26	4160		4L4' T8/ELEC	26	2860	1.3	2704	$2,340.00	$459.68	5.1			0	$0.00	$0.00		$390.00	$0.00	2704	$1,950.00	$459.68	4.2
29	2	Exit	24	8760	15W Exit	1	15		LED	1	2	0.013	114	$40.00	$19.36	2.1			0	$0.00	$0.00		$10.00	$0.00	114	$30.00	$19.36	1.5
30	1	Office	8	2080	4L4' EE/STD	6	960		4L4' T8/ELEC	6	660	0.3	624	$540.00	$106.08	5.1			0	$0.00	$0.00		$90.00	$0.00	624	$450.00	$106.08	4.2
31	1	Office	8	2080	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	208	$180.00	$35.36	5.1			0	$0.00	$0.00		$30.00	$0.00	208	$150.00	$35.36	4.2
32	1	Tax Assessor	8	2080	4L4' EE/STD	4	640		4L4' T8/ELEC	4	440	0.2	416	$360.00	$70.72	5.1			0	$0.00	$0.00		$60.00	$0.00	416	$300.00	$70.72	4.2
33	1	Office	8	2080	4L4' EE/STD	2	320		4L4' T8/ELEC	2	220	0.1	208	$180.00	$35.36	5.1			0	$0.00	$0.00		$30.00	$0.00	208	$150.00	$35.36	4.2
34	1	Office	8	2080	4L4' EE/STD	1	160		4L4' T8/ELEC	1	110	0.05	104	$90.00	$17.68	5.1			0	$0.00	$0.00		$15.00	$0.00	104	$75.00	$17.68	4.2
35	1	Office	8	2080	4L4' EE/STD	4	640		4L4' T8/ELEC	4	440	0.2	416	$360.00	$70.72	5.1			0	$0.00	$0.00		$60.00	$0.00	416	$300.00	$70.72	4.2
36	1	General Area	14	3640	4L4' EE/STD	19	3040		4L4' T8/ELEC	19	2090	0.95	3458	$1,710.00	$587.86	2.9			0	$0.00	$0.00		$285.00	$0.00	3458	$1,425.00	$587.86	2.4
37	2	Exit	24	8760	15W Exit	1	15		LED	1	2	0.013	114	$40.00	$19.36	2.1			0	$0.00	$0.00		$10.00	$0.00	114	$30.00	$19.36	1.5
38	6	Outside	7	2555	75W HALOGEN	4	300		26W CF/SI	4	112	0.188	480	$40.00	$81.66	0.5			0	$0.00	$0.00		$0.00	$0.00	480	$40.00	$81.66	0.5

Appendix B: Third Party Energy Suppliers (ESCOs)

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

Third Party Gas Suppliers for Elizabethtown Gas Co. Service Territory	Telephone & Web Site
Cooperative Industries	(800) 628-9427
412-420 Washington Avenue	www.cooperativenet.com
Belleville, NJ 07109	
Direct Energy Services, LLC	(866) 547-2722
120 Wood Avenue, Suite 611	www.directenergy.com
Iselin, NJ 08830	
Gateway Energy Services Corp.	(800) 805-8586
44 Whispering Pines Lane	www.gesc.com
Lakewood, NJ 08701	
UGI Energy Services, Inc.	(856) 273-9995
704 East Main Street, Suite 1	www.ugienergyservices.com
Moorestown, NJ 08057	
Great Eastern Energy	(888) 651-4121
116 Village Riva, Suite 200	www.greateastern.com
Princeton, NJ 08540	
Glacial Energy of New Jersey, Inc.	(877) 569-2841
207 LaRoche Avenue	www.glacialenergy.com
Harrington Park, NJ 07640	
Hess Corporation	(800) 437-7872
1 Hess Plaza	www.hess.com
Woodbridge, NJ 07095	
Intelligent Energy	(800) 724-1880
2050 Center Avenue, Suite 500	www.intelligentenergy.org
Fort Lee, NJ 07024	
Metromedia Energy, Inc.	(877) 750-7046
6 Industrial Way	www.metromediaenergy.com
Eatontown, NJ 07724	
MxEnergy, Inc.	(800) 375-1277
510 Thornall Street, Suite 270	www.mxenergy.com
Edison, NJ 08837	
NATGASCO (Mitchell Supreme)	(800) 840-4427
532 Freeman Street	www.natgasco.com
Orange, NJ 07050	
Pepco Energy Services, Inc.	(800) 363-7499
112 Main Street	www.pepco-services.com
Lebanon, NJ 08833	
PPL EnergyPlus, LLC	(800) 281-2000
811 Church Road	www.pplenergyplus.com
Cherry Hill, NJ 08002	
South Jersey Energy Company	(800) 756-3749
One South Jersey Plaza, Route 54	www.southjerseyenergy.com
Folsom, NJ 08037	
Sprague Energy Corp.	(800) 225-1560
12 Ridge Road	www.spragueenergy.com
Chatham Township, NJ 07928	
Woodruff Energy	(800) 557-1121
73 Water Street	www.woodruffenergy.com
Bridgeton, NJ 08302	