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*June 17, 2010*

**Local Government Energy Program**
**Energy Audit Report**

***For***

# *Middletown Township*
# *Croydon Hall Gym*
***900 Leonardville Road***
***Leonardo, NJ 07737***

***Project Number: LGEA41***

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## INTRODUCTION

On November 23, 2009 and December 7, 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 Gymnasium Building. The building is located at 900 Leonardville Road, Leonardo, NJ 07737, 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 two-story facility was built in 1961. The building's two stories have a total area of 11,450 square feet and consist primarily of an aerobic room, an interior basketball court, stage, and ancillary space that are used for the fire department. The Gym is used for basketball and indoor sports. The building is open as needed for various sporting events approximately 91 hours per week. There are no permanent employees in the building.

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 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 Croydon Hall Gymnasium building, located at 900 Leonardville Road, Leonardo, New Jersey 07737.

Based on the field visits performed by SWA/BSG-PMK staff on November 23, 2009 and December 7, 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 70,400 kWh of electricity for a total cost of $15,524 and 7,713 therms of natural gas, for a total cost of $10,683.

With electricity and fossil fuel combined, the building consumed 1,012 MMBtus of energy at a total cost of $26,207.

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 89.0 kBtu/sq.ft/year. After energy efficiency improvements are made, future utility bills can be added to the Portfolio Manager and the site energy use intensity for a different time period can be compared to the year 2009 baseline to track the changes in energy consumption associated with the energy improvements.

Buildings achieving an Energy Star rating of 75 are eligible to apply for the Energy Star award and receive the Energy Star plaque to convey superior performance. These ratings also greatly help when applying for Leadership in Energy and Environmental Design (LEED) building certification through the United States Green Building Council (USGBC). 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 building performance rating could not be determined because this is a mixed-use facility, comprised by non-eligible space types categorized as "Other".

(Refer to Section 1.3 for Energy Star Rating)

### Category I Recommendations: Capital Improvement Measures

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

### Category II Recommendations: Operations and Maintenance

- The return grills on the rooftop units (ceiling) should be cleaned. This will increase system performance and reduce energy consumption.

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

At this time, SWA/BSG-PMK highly recommends a total of **4** Energy Conservation Measures (ECMs) for the Gym that are summarized in the following tables. The total investment cost for these ECMs is **$23,076**. SWA/BSG-PMK estimates a first year savings of **$4,509** with a simple payback of **5.1 years**. SWA/BSG-PMK estimates that implementing the highly recommended ECMs will reduce the carbon footprint of the Gym by **33,566 lbs of $CO_2$**.

SWA/BSG-PMK also recommends that the Township of Middletown contact 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 $ 0.07/kWh, which would have equated to $10,560 for the past 12 months.

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 recommends 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 41.1 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 | $0.22 | $/kWh |
| Energy price escalation rate: | 0% | per DOE FEMP guidelines | Gas rate | $1.38 | $/therm |

| | | | |
|---|---|---|---|
| Avg. Annual Demand: | 0.006357 | Area of Building (SF) | 11,450 |

**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 | $696 | $120 | $576 | 2,276 | 1.21 | 0 | 0.68 | $0 | $501 | 15 | $5,891 | 1.15 | 6151% | 410% | 87% | $5,400 | 3,117 |
| 2 | Hot Water Outdoor Air Reset Control | Similar Projects | $2,000 | $0 | $2,000 | 0 | 0.00 | 617 | 5.39 | $0 | $852 | 10 | $7,190 | 2.35 | 2595% | 260% | 41% | $5,264 | 7,220 |
| 3 | Vending Machine Occupancy Sensors | Similar Projects | $500 | $0 | $500 | 2,415 | 1.28 | 0 | 0.72 | $0 | $531 | 10 | $4,486 | 0.94 | 7972% | 797% | 106% | $4,032 | 3,309 |
| TOTAL | | | $3,196 | $120 | $3,076 | 4,691 | 2.48 | 617 | 6.79 | $0.00 | $1,883 | - | $17,567 | 1.63 | - | - | - | $14,696 | 13,646 |

| Table 2 - Recommended 5-10 Year Payback ECMs | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECM # | ECM description | Source | Est. Installed Cost, $ | Est. Incentives, $ | Net Est. ECM Cost with Incentives, $ | kWh, 1st Yr Savings | kW, Demand Reduction/Mo | Therms, 1st Yr Savings | kBtu/sq ft, 1st Yr Savings | Est. Operating Cost, 1st Yr Savings, $ | Total 1st Yr Savings, $ | Life of Measure, Yrs | Est. Lifetime Energy Cost Savings, $ | Simple Payback, Yrs | Lifetime Return on Investment, % | Annual Return on Investment, % | Internal Rate of Return, % | Net Present Value, $ | $CO_2$ Reduced, lbs/yr |
| 4 | Building Automation System for Night Setback | Similar projects | $20,000 | $0 | $20,000 | 4,732 | 2.51 | 1,148.55 | 11.44 | $0 | $2,626 | 15 | $30,900 | 7.62 | 363% | 24% | 10% | $11,349 | 19,921 |
| TOTAL | | | $20,000 | $0 | $20,000 | 4,732 | 2.51 | 1,149 | 11.44 | $0.00 | $2,626 | - | $30,900 | 7.62 | - | - | - | $11,349 | 19,921 |

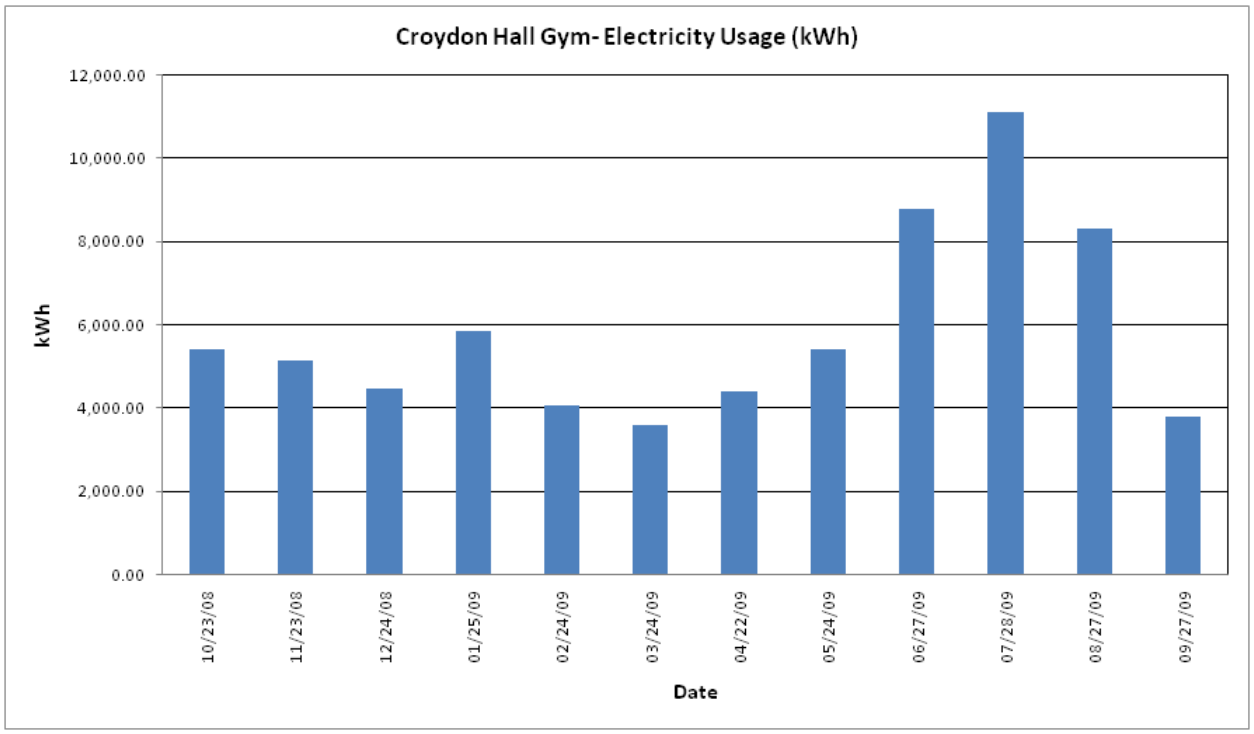
## 1. HISTORIC ENERGY CONSUMPTION

### 1.1 Energy Usage and Cost Analysis

SWA/BSG-PMK analyzed utility bills from November, 2007 through November, 2009 that were received from the utility companies supplying the Croydon Hall Gym with electric and natural gas.

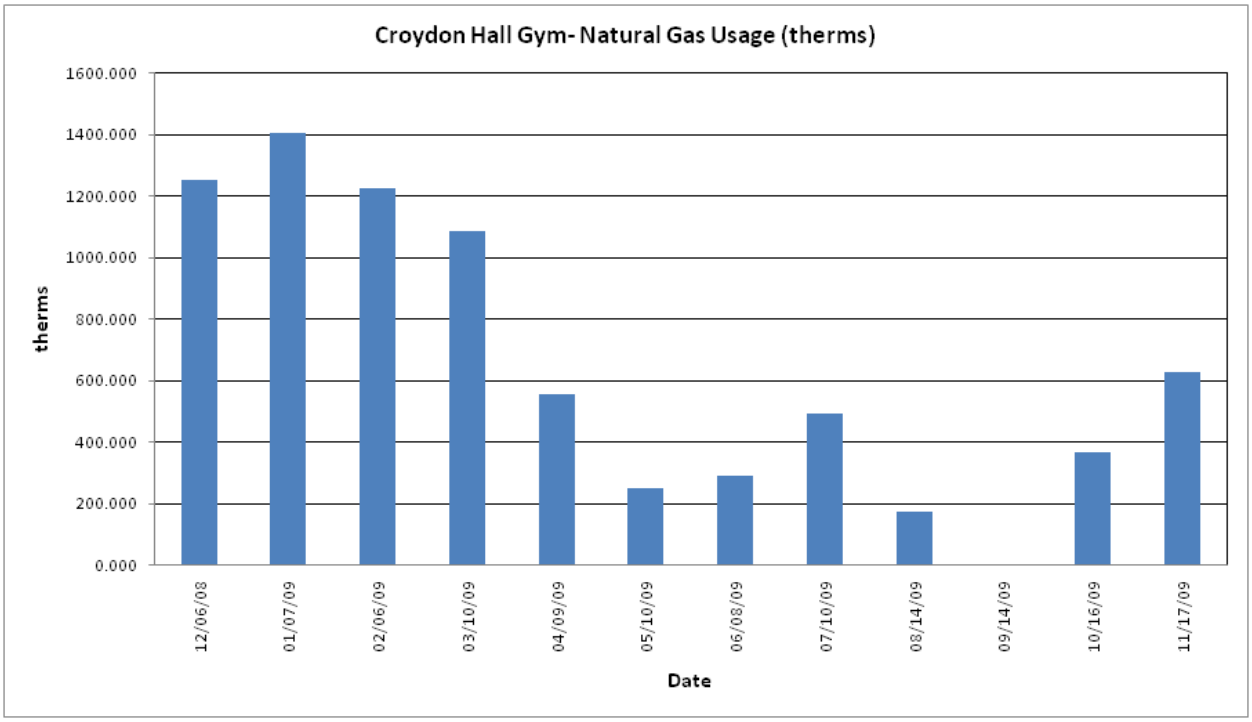
Electricity - The Croydon Hall Gym is currently served by one electric meter and receives electricity from Jersey Central Power & Light at **an average rate of $0.221/kWh** based on 12 months of utility bills from October, 2008 through September, 2009. The building consumed **70,400 kWh or $15,524 worth of electricity** during that time span. The high electricity rate is caused by delivery charges that are added to the low usage causing the average to be high.

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




Natural Gas - The Croydon Hall Gym receives gas from New Jersey Natural Gas at **an average rate of $1.385/therm** based on 12 months of utility bills from December, 2008 through November, 2009. The building consumed **7,713 therms or $10,683 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 Croydon Hall Gym currently purchases electricity from Jersey Central Power & Light for electricity use (kWh) with a separate (kW) demand charge. The complex currently pays an average rate of approximately $0.221/kWh based on the 12 months of utility bills of October, 2008 through September, 2009.

The Croydon Hall Gym currently purchases natural gas supply and transmission from New Jersey Natural Gas at an average aggregated rate of $1.385/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. SWA/BSG-PMK recommends that the Township maintain the Portfolio Manager account at the link below. As the account is maintained, SWA/BSG-PMK can share with the Township and allow future data to be added and tracked using the benchmarking tool.

**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). 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 89.0 kBtu/ft$^2$yr compared to the national average of 65.0 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 18.2 kBtu/ft$^2$yr, which when implemented would lower the buildings energy consumption.

OMB No. 2060-0347

# STATEMENT OF ENERGY PERFORMANCE
## Croydon Hall Gym

**Building ID:** 2216468
**For 12-month Period Ending:** October 31, 2009[1]
**Date SEP becomes ineligible:** N/A

**Date SEP Generated:** February 28, 2010

**Facility**
Croydon Hall Gym
900 Leonardville Rd
Leonardo, NJ 07737

**Facility Owner**
Middletown Township
1 Kings Highway
Middletown, NJ 07749

**Primary Contact for this Facility**
Jason Greenspan
1 King's Highway
Middletown, NJ 07737

**Year Built:** 1961
**Gross Floor Area (ft²):** 11,450

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

| **Site Energy Use Summary**[3] | |
|---|---|
| Electricity - Grid Purchase(kBtu) | 240,205 |
| Natural Gas (kBtu)[4] | 773,116 |
| Total Energy (kBtu) | 1,013,321 |

| **Energy Intensity**[5] | |
|---|---|
| Site (kBtu/ft²/yr) | 89 |
| Source (kBtu/ft²/yr) | 141 |

| **Emissions** (based on site energy use) | |
|---|---|
| Greenhouse Gas Emissions ($MtCO_2e$/year) | 78 |

**Electric Distribution Utility**
FirstEnergy - Jersey Central Power & Lt Co

| **National Average Comparison** | |
|---|---|
| National Average Site EUI | 65 |
| National Average Source EUI | 136 |
| % Difference from National Average Source EUI | 4% |
| Building Type | Recreation |

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.

## 2. FACILITY AND SYSTEMS DESCRIPTION

### 2.1 Building Characteristics

The Gym was built in 1961. The building's two stories have a total area of 11,450 square feet and consist primarily of an aerobic room, an interior basketball court, stage and ancillary space that is used for the fire department. The Gym is used for basketball and indoor sports.

### 2.2 Building Occupancy Profiles

The building is open as needed for various sporting events approximately 91 hours per week. There are no permanent employees in the building.

### 2.3 Building Envelope

#### 2.3.1 Exterior Walls

The exterior walls are constructed from concrete block with a newly applied exterior insulation finish system (EIFS). The walls are in good condition. The interior wall surfaces are painted concrete block.

#### 2.3.2 Roof

The building has a built up roof with a reflective coating. The roof was found to be in fair condition.

#### 2.3.3 Base

The base of the building is poured concrete on grade. The base was found to be in fair condition

#### 2.3.4 Windows

There are thermal pane vinyl windows on the building. The windows are in good condition.

#### 2.3.5 Exterior doors

The exterior grade hollow metal doors are in good condition.

#### 2.3.6 Building air tightness

The building is tight and there are visual signs of outside air infiltration.

## 2.4 HVAC Systems

### 2.4.1 Heating

Domestic hot water and baseboard radiant heating is provided by a Peerless natural gas, hot water boiler, model number EC/ECT-06-300-W/S, 347 MBH, and an efficiency of 83.7%. The unit is in good condition. Seven York rooftop units, model number D7CG060N09925E, each provide 125 MBH of heat at 80% efficiency.

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.

Category III Recommendations – ECM #4: Install a building automation system (BAS) that will control building conditions automatically for unoccupied periods, including night set back.

*Peerless boiler*

### 2.4.2 Cooling

The building has four air-conditioning units. An EMI split-system, which is approximately 2-3 tons, that conditions the front entrance. There are two through-the-wall air-conditioning units in the cardiovascular training room. The six York rooftop units provide heating and 5 tons of cooling each for the basketball courts and stage area. One additional York unit provides supplemental heat and cooling for the first floor rooms.

*EMI split-system (left) & York RTU (right)*

Category II Repair and Maintenance: Clean all return air grills on gymnasium roof top units (accumulated dust from floor sanding).

### 2.4.3 Ventilation

There are two bathroom exhaust fans on the roof; one is a Jenn Air unit with model number 301 BCRG. The other has a missing nameplate. Natural ventilation is also provided by the facility doors and windows.

### 2.4.4 Domestic Hot Water

Water is heated by an AO Smith, gas-fired domestic water heater. The 75 gallon unit has a heating capacity of 75 MBH.

*AO Smith Water Heater*

## 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 $501 based on the current $0.221/kWh and the current occupancy schedule. Implementation of this ECM will cost approximately $696. Currently the Board of Public Utilities (BPU) would offer an estimated rebate of $120, yielding a net cost of $576 for this project. With a yearly savings of $501the payback on this ECM would about 1.2 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. Lighting sensors are already installed at the facility.

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

### 2.5.2 Appliances and process

There are two older vending machines inside the front entrance.

### 2.5.3 Elevators

There are no elevators in the facility.

### 2.5.4 Other electrical systems

There are no other major electrical systems installed at the Croydon Hall Gym.

## 3. EQUIPMENT LIST

| Building System | Description | Location | Model # | Fuel | Space Served | Estimated Remaining Useful Life % |
|---|---|---|---|---|---|---|
| Heating | Hot water boiler, 347,000 BTU/Hr | MER | Peeless #EC/ECT-06-300-W/S | Natural gas | Building | 80% |
| | Circulation Pump | MER | Bell & Gossett | Electric | Boiler | 40% |
| Domestic Hot Water | Domestic Hot Water Heater, 75 gallons | MER | A.O. Smith M# B239915000 | Natural gas | Building | 62% |
| Cooling | Through-the-Wall AC Unit (Quantity: 2) | Cardio room | No access | Electric | Cardio room | 75% |
| Vending Machines | Quantity: 2 | Entrance | Nameplates not accessible | Electric | Entrance | 75% |
| Cooling | Roof Top Unit, 5 tons, 10 SEER; 125 MBH gas heat, 80% efficient | Lower Roof | York #D7CG060N09925EBA | Electric | Offices | 60% |
| Cooling | 6 Roof Top Units, 5 tons, 10 SEER; 125 MBH gas heat, 80% efficient | Roof | York #D7CG060N09925EBA | Electric | Gym | 60% |
| Ventilation | Exhaust Fan | Roof | Nameplate missing | Electric | Restroom Exhaust | 20% |
| Ventilation | Exhaust Fan | Roof | Jenn Air #301 BCRG | Electric | Restroom Exhaust | 20% |
| Cooling | Split-system condensing unit, 2-3 tons | Roof | EMI | Electric | Lobby | 50% |
| | Air-handler | Wall-mounted | EMI | | | 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 Croydon Hall Gym, 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's survey, no capital improvement measures are recommended.

### Category II Recommendations: Operations and Maintenance

Clean all return grills (ceiling) on the gymnasium rooftop units. This is possibly dust from the floor finishing.

### Category III Recommendations: Energy Conservation Measures

**Summary table**

| ECM # | Description |
|---|---|
| 1 | Lighting Upgrades |
| 2 | Hot Water Outdoor Air Reset Control |
| 3 | Vending Misers |
| 4 | Building Automation System for Night Setback |

## ECM#1: Lighting Upgrades

**Description:**

Lighting at the Gym consists primarily of T-8 fluorescent lamps with electronic ballasts, some T-12 fluorescent lamps with magnetic ballasts and a few incandescent lamps. It is recommended that all T-12 fixtures with magnetic ballasts be retrofit with T-8 lamps and electronic ballasts and the incandescent lamps be replaced with compact fluorescents. The exterior was lit with halogen lamps that should be replaced with compact fluorescents. The exterior lighting also consist of H.I.D. wall mounted fixtures. 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** | $696.00 | $0.00 | $696.00 |
| **Rebate** | $120.00 | $0.00 | $120.00 |
| **Net Cost** | $576.00 | $0.00 | **$576.00** |
| **Savings (kWh)** | 2,276 | 0 | **2,276** |
| **Savings ($)** | $500.61 | $0.00 | **$500.61** |
| **Payback** | 1.2 | | **1.2** |

**Variables:**

| | |
|---|---|
| **$0.22** | **Avg. Electric Rate ($/kWh)** |
| | **Avg. Demand Rate ($/kW)** |
| **4732** | **Operating Hours/Year** |
| **15** | **Operating Hours/Work Day** |

**Assumptions:**

| | |
|---|---|
| **25%** | **Occupancy Sensor Savings (Avg)** |
| **40%** | **Occupancy Sensor Savings(>Avg)** |

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 | $696 | $120 | $576 | 2,276 | 1.21 | 0 | 0.68 | $0 | $501 | 15 | $5,891 | 1.15 | 6151% | 410% | 87% | $5,400 | 3,117 |

**Assumptions:**

The electric cost used in this ECM was $0.221/kWh, which was the average rate for the 12-month period ranging from October, 2008 through September, 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 $120.

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

**Description:**

Heating is provided by hot water boiler, located in the mechanical room. The boiler is in good condition, but can be made even more efficient by installing outside air reset control. The boiler is designed to provide hot water to the radiators and hot water coils at a constant temperature, of approximately180°F. This can cause the system to provide excess heat to the space when the outside air temperature increases wasting energy and increases energy bills. Outside 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 be 130°F.

**Installation cost:**

Estimated installed cost: $2,000
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, $ | $CO_2$ Reduced, lbs/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Hot Water Outdoor Air Reset Control | Similar Projects | $2,000 | $0 | $2,000 | 0 | 0.00 | 617 | 5.39 | $0 | $852 | 10 | $7,190 | 2.35 | 2595% | 260% | 41% | $5,264 | 7,220 |

**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%, was used. From November 11th, 2008 through December 1st, 2009, the Gym consumed 7,713 therms at a rate of $1.38 per therm.

**Rebates/financial incentives:**

No rebates for outside air reset control are available.

## ECM#3: Vending 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 occupancy sensors on the Gym's two vending machines would activate the power to the vending machines when in use, and deactivate the power to the lights and refrigeration unit if the vending machines have not been used for 15 minutes. The vending machine lighting would remain off until the adjacent area is occupied again. The refrigeration unit will be only shut down for a maximum two hours, in order to maintain a desirable temperature.

**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, $ | $CO_2$ Reduced, lbs/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | Vending Machine Occupancy Sensors | Similar Projects | $500 | $0 | $500 | 2,415 | 1.28 | 0 | 0.72 | $0 | $531 | 10 | $4,486 | 0.94 | 7972% | 797% | 106% | $4,032 | 3,309 |

**Assumptions:**

The electric cost used in this ECM was $0.22/kWh, which was the Gym's average rate for the 12-month period ranging from October 8th, 2008 through October 12th, 2009. The average vending machine consumes 4,025 kWh per year. Energy savings for a vending machine in medium occupancy (about 81-94 hours per week) areas is about 30%.

**Rebates/financial incentives:**

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

## ECM #4: Building Automation System for Night Setback

### Description:

The Gym's 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: $20,000
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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Building Automation System for Night Setback | Similar projects | $20,000 | $0 | $20,000 | 4,732 | 2.51 | 1,148.55 | 11.44 | $0 | $2,626 | 15 | $30,900 | 7.62 | 363% | 24% | 10% | $11,349 | 19,921 |

### Assumptions:

Energy costs, taken from 12 months of energy bills, are $1.385/therm for natural gas and $0.221/kWh for electric. 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 were calculated to be 7,713 therms of natural gas and 15,260 kWh of electricity, respectively. The annual heating consumptions were assumed to be the 100% of the Gym's natural gas consumption. The cooling consumption, due to the fact that the electric consumptions from May through August were higher than those in the rest of the year, was assumed to be the difference between the average consumption from May through August and the average electric consumption for the rest of the year. The average hours of setback for the building were estimated to be 11 hours every night, as the facility is in use 13 hours per day. 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 high cost of installation and small area of viable space available.

### 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.

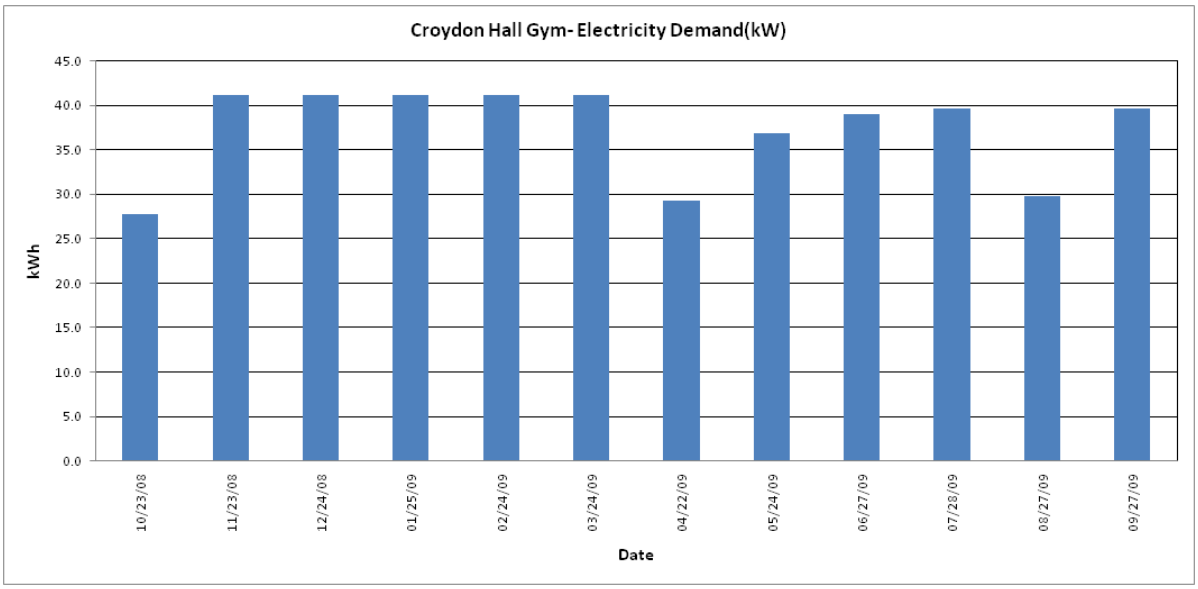
### 5.6 Wind

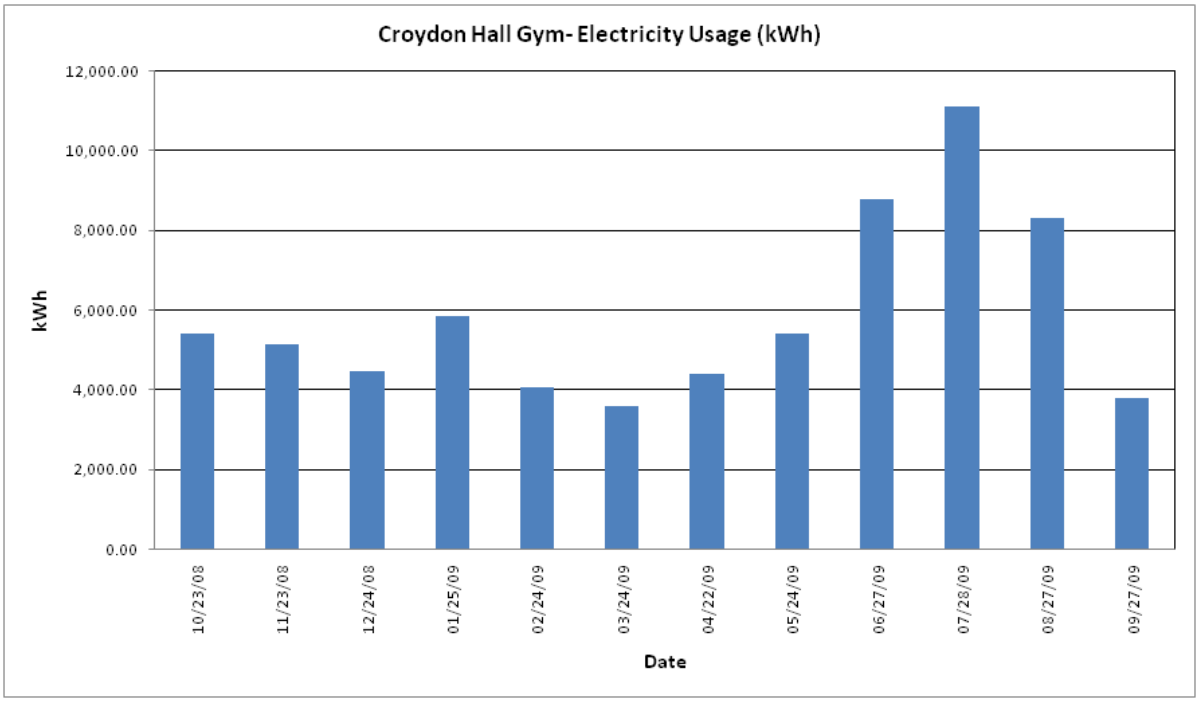
Wind power production is not appropriate for this location because required land is not available for the wind turbine. Also, the available wind energy resource is very low.

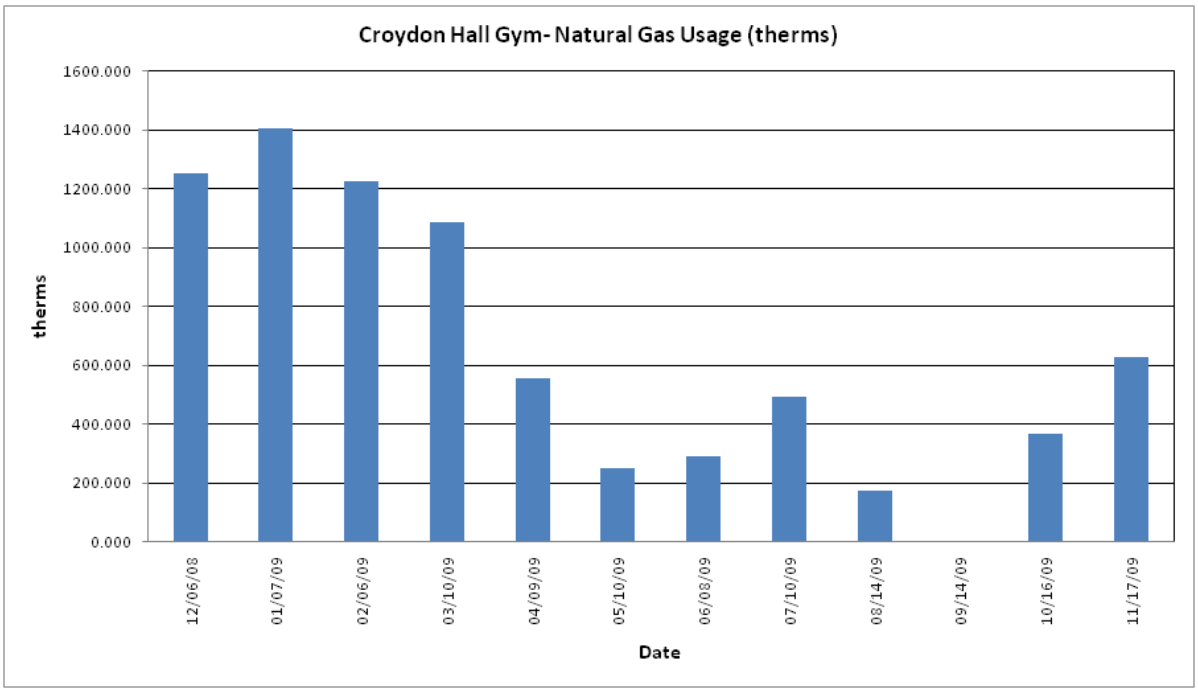
## 6. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

### 6.1 Load profiles

The average electrical peak demand for the facility during previous year was 30.7 kW and the maximum peak demand was 41.1 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.


Croydon Hall Gym- Electricity Demand(kW)
kWh
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
10/23/08
11/23/08
12/24/08
01/25/09
02/24/09
03/24/09
04/22/09
05/24/09
06/27/09
07/28/09
08/27/09
09/27/09
Date


Croydon Hall Gym- Electricity Usage (kWh)
kWh
12,000.00
10,000.00
8,000.00
6,000.00
4,000.00
2,000.00
0.00
10/23/08
11/23/08
12/24/08
01/25/09
02/24/09
03/24/09
04/22/09
05/24/09
06/27/09
07/28/09
08/27/09
09/27/09
Date

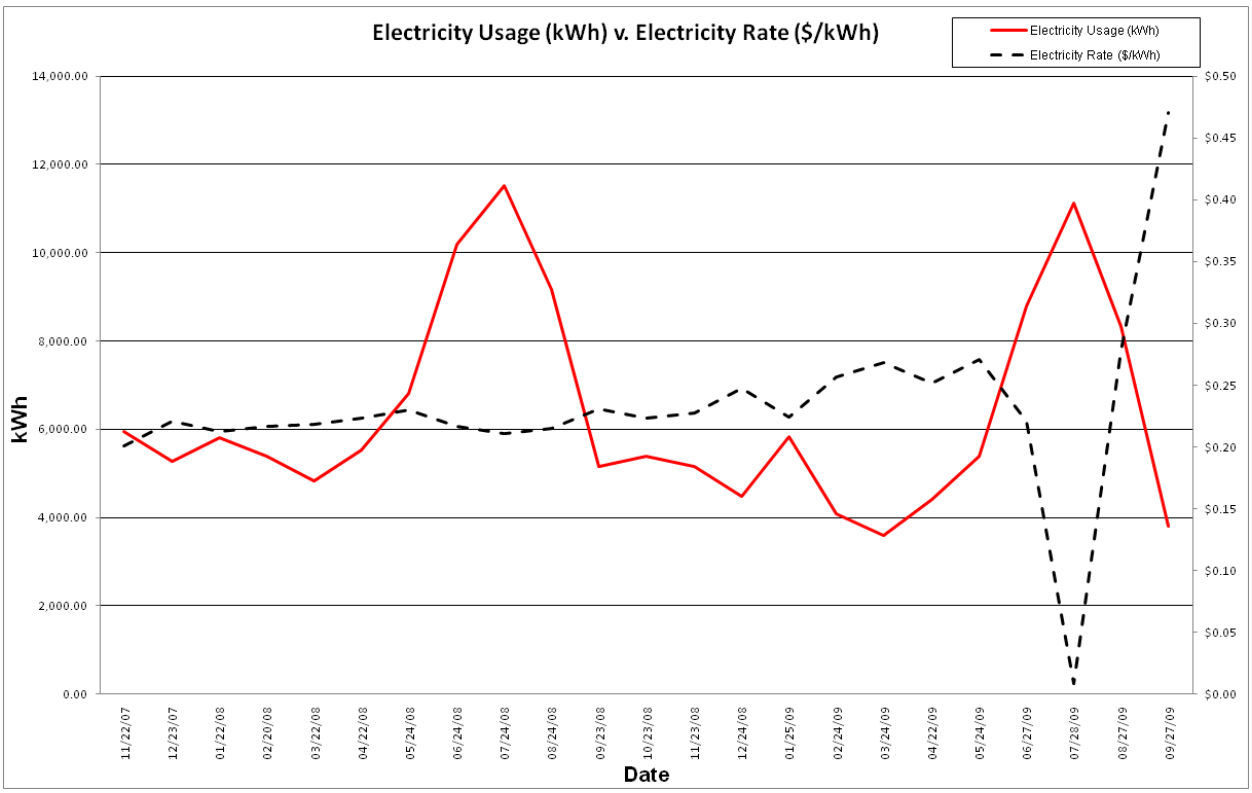



## 6.2 Energy Procurement strategies

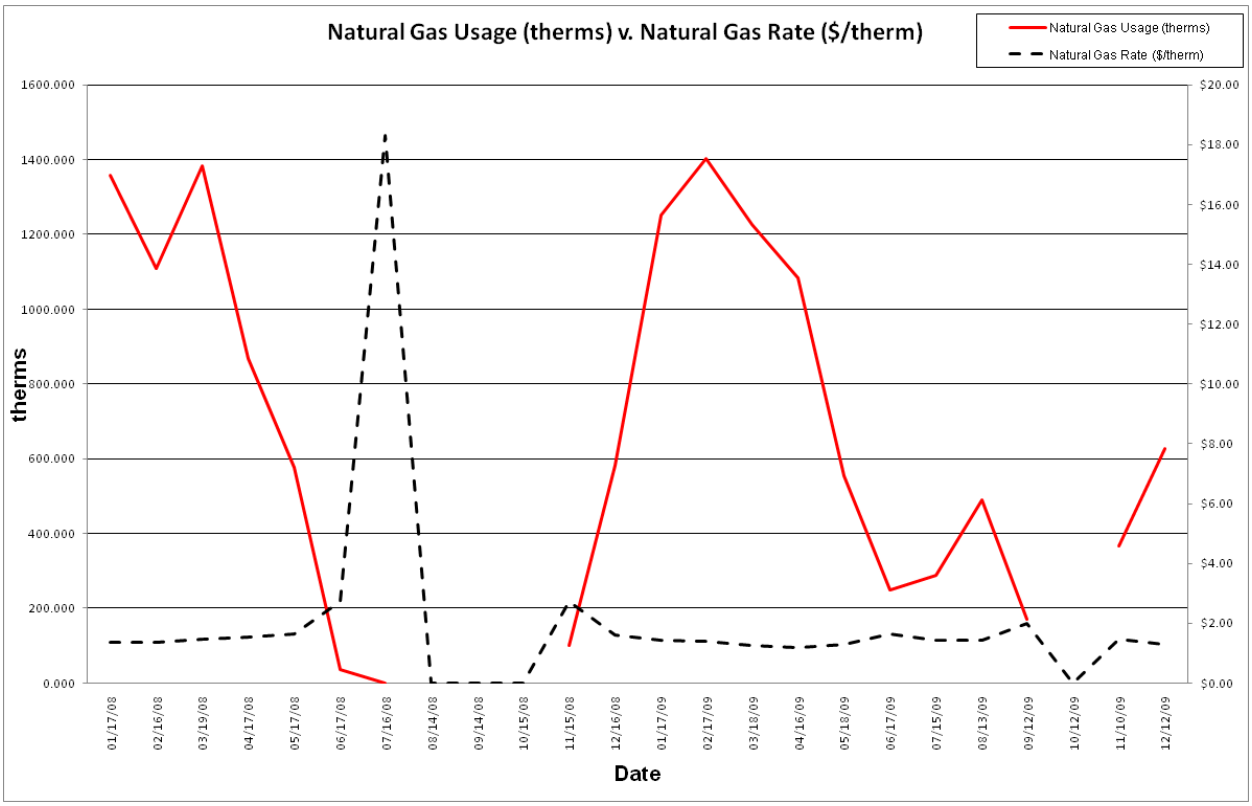
Billing analysis shows price fluctuations of over 20% over the course of the year for the building's electrical and natural gas accounts. This may be reflective of the utility tariffs under which the building owner secures its' energy supply. These tariffs often include seasonally adjusted demand charges, 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).

SWA/BSG-PMK also recommends that the Township of Middletown contact 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 $ 0.07/kWh, which would have equated to $10,560 for the past 12 months. Over the past 12 months the natural gas rate has been below the state average.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*




*Natural gas prices and usage levels fluctuate over the course of the year*

## 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)<br>RS Means 2009 (Building Construction Cost Data)<br>RS Means 2009 (Mechanical Cost Data)<br>Published and established specialized equipment material and labor costs.<br>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**
**Gym**
**900 Leonadville Road**

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 | 5 | $90.00 | $15.00 |
| 2 | (4) 4' 32W T8 Lamps, Electronic Ballasts / No Upgrade | 4L4' T8/ELEC | 110 | No Upgrade | 110 | 32 | $0.00 | $0.00 |
| 3 | LED Exit Sign / No Upgrade | LED | 2 | No Upgrade | 2 | 7 | $0.00 | $0.00 |
| 4 | (2) 32W T8 U-Tube Lamps, Electronic Ballasts / No Upgrade | 2L22" | 62 | No Upgrade | 62 | 22 | $0.00 | $0.00 |
| 5 | (2) 4' 32W T8 Lamps, Electronic Ballasts / No Upgrade | 2L4' T8/ELEC | 61 | No Upgrade | 61 | 4 | $0.00 | $0.00 |
| 6 | 44W Compact Fluorescent lamp / No Upgrade | 44W CF/SI | 44 | No Upgrade | 44 | 1 | $0.00 | $0.00 |
| 7 | (2) 8' 34W T12 Lamps, Magnetic Ballasts / Retrofit with T8 Lamps, Electronic Ballast | 2L8' EE/STD | 138 | 2L8' T8/ELEC | 118 | 3 | $60.00 | $15.00 |
| 8 | 75W Halogen Lamp | 75W HALOGEN | 75 | 26W CF/SI | 28 | 6 | $10.00 | $0.00 |
| 9 | 60W Incandescent Lamp / Replace with 15W Compact Fluorescent lamp | 60W INCANDESCENT | 60 | 15W CF/SI | 15 | 1 | $6.00 | $0.00 |
| 10 | 250W Metal Halide HID Fixture | 250W MH/BALLAST | 286 | No Upgrade | 286 | 12 | $0.00 | $0.00 |
| 11 | 150W Metal Halide Fixture | 150W MH/BALLAST | 195 | No Upgrade | 195 | 3 | $0.00 | $0.00 |
| 12 | 28W Compact Fluorescent Lamp | 28W CF/HW | 30 | No Upgrade | 30 | 1 | $0.00 | $0.00 |

## Summary

| | Lighting (Only) | Sensors (Only) | Complete Lighting Upgrade |
|---|---|---|---|
| Cost | $696.00 | $0.00 | $696.00 |
| Rebate | $120.00 | $0.00 | $120.00 |
| Net Cost | $576.00 | $0.00 | **$576.00** |
| Savings (kWh) | 2,276 | 0 | **2,276** |
| Savings ($) | $500.61 | $0.00 | **$500.61** |
| Payback | 1.2 | | **1.2** |

**Variables:**

| | |
|---|---|
| $0.22 | Avg. Electric Rate ($/kWh) |
| | Avg. Demand Rate ($/kW) |
| 4732 | Operating Hours/Year |
| 15 | 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:** | | | | | 10957 | | | | 10320 | 0.637 | 2276 | $696.00 | $500.61 | 1.4 | | | 0 | $0.00 | $0.00 | | $120.00 | $0.00 | 2276 | $576.00 | $500.61 | 1.2 |
| 1 | 1 | Lobby | 15 | 4732 | 4L4' EE/STD | 4 | 640 | | 4L4' T8/ELEC | 4 | 440 | 0.2 | 946 | $360.00 | $208.21 | 1.7 | | | 0 | $0.00 | $0.00 | | $60.00 | $0.00 | 946 | $300.00 | $208.21 | 1.4 |
| 2 | 2 | Corridor | 15 | 4732 | 4L4' T8/ELEC | 9 | 990 | | No Upgrade | 9 | 990 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 3 | 3 | Corridor | 15 | 4732 | LED | 3 | 6 | | No Upgrade | 3 | 6 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 4 | 1 | Corridor | 15 | 4732 | 4L4' EE/STD | 1 | 160 | | 4L4' T8/ELEC | 1 | 110 | 0.05 | 237 | $90.00 | $52.05 | 1.7 | | | 0 | $0.00 | $0.00 | | $15.00 | $0.00 | 237 | $75.00 | $52.05 | 1.4 |
| 5 | 2 | Women's Room | 15 | 4732 | 4L4' T8/ELEC | 7 | 770 | | No Upgrade | 7 | 770 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 6 | 4 | Women's Room | 15 | 4732 | 2L22" | 1 | 62 | | No Upgrade | 1 | 62 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 7 | 2 | Men's Room | 15 | 4732 | 4L4' T8/ELEC | 7 | 770 | | No Upgrade | 7 | 770 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 8 | 4 | Men's Room | 15 | 4732 | 2L22" | 1 | 62 | | No Upgrade | 1 | 62 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 9 | 10 | Gym | 15 | 4732 | 250W MH/BALLA | 12 | 3432 | | No Upgrade | 12 | 3432 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 10 | 3 | EXIT | 15 | 4732 | LED | 4 | 8 | | No Upgrade | 4 | 8 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 11 | 5 | Stage | 15 | 4732 | 2L4' T8/ELEC | 4 | 244 | | No Upgrade | 4 | 244 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 12 | 6 | Boiler Room | 1 | 315.467 | 44W CF/SI | 1 | 44 | | No Upgrade | 1 | 44 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 13 | 7 | Fire Dept. | 15 | 4732 | 2L8' EE/STD | 1 | 138 | | 2L8' T8/ELEC | 1 | 118 | 0.02 | 95 | $60.00 | $20.82 | 2.9 | | | 0 | $0.00 | $0.00 | | $15.00 | $0.00 | 95 | $45.00 | $20.82 | 2.2 |
| 14 | 2 | First Aid | 15 | 4732 | 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 | |
| 15 | 2 | Room | 15 | 4732 | 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 | |
| 16 | 2 | Room | 15 | 4732 | 4L4' T8/ELEC | 1 | 110 | | No Upgrade | 1 | 110 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 17 | 4 | Janitors Closet | 2 | 630.933 | 2L22" | 20 | 1240 | | No Upgrade | 20 | 1240 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 18 | 7 | Closet | 0.5 | 157.733 | 2L8' EE/STD | 2 | 276 | | 2L8' T8/ELEC | 2 | 236 | 0.04 | 6 | $120.00 | $1.39 | 86.5 | | | 0 | $0.00 | $0.00 | | $30.00 | $0.00 | 6 | $90.00 | $1.39 | 64.8 |
| 19 | 8 | Stairwell | 17 | 5362.93 | 75W HALOGEN | 2 | 150 | | 26W CF/SI | 2 | 56 | 0.094 | 504 | $20.00 | $110.91 | 0.2 | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 504 | $20.00 | $110.91 | 0.2 |
| 20 | 9 | Closet | 0.5 | 157.733 | 60W INCANDESC | 1 | 60 | | 15W CF/SI | 1 | 15 | 0.045 | 7 | $6.00 | $1.56 | 3.8 | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 7 | $6.00 | $1.56 | 3.8 |
| 21 | 11 | Outside | 7 | 2555 | 150W MH/BALLA | 3 | 585 | | No Upgrade | 3 | 585 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 22 | 12 | Outside | 7 | 2555 | 28W CF/HW | 1 | 30 | | No Upgrade | 1 | 30 | 0 | 0 | $0.00 | $0.00 | | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 0 | $0.00 | $0.00 | |
| 23 | 8 | Outside | 7 | 2555 | 75W HALOGEN | 4 | 300 | | 26W CF/SI | 4 | 112 | 0.188 | 480 | $40.00 | $105.67 | 0.4 | | | 0 | $0.00 | $0.00 | | $0.00 | $0.00 | 480 | $40.00 | $105.67 | 0.4 |

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

| Supplier | Telephone & Web Site |
|---|---|
| American Powernet Management, LP<br>437 North Grove St.<br>Berlin, NJ 08009<br>Attn: Brian Vayda | 877-977-2636<br><br>bvayda@americanpowernet.com<br>www.americanpowernet.com |
| Commerce Energy, Inc.<br>4400 Route 9 South, Suite 100<br>Freehold, NJ 07728 | (800) 556-8457<br><br>www.commerceenergy.com |
| ConEdison Solutions<br>Cherry Tree Corporate Center<br>535 State Highway 38<br>Cherry Hill, NJ 08002 | (888) 665-0955<br><br>www.conedsolutions.com |
| Constellation NewEnergy, Inc.<br>900A Lake Street, Suite 2<br>Ramsey, NJ 07446 | (888) 635-0827<br><br>www.newenergy.com |
| Credit Suisse, (USA) Inc.<br>700 College Road East<br>Princeton, NJ 08450 | 212-538-3124<br><br>www.creditsuisse.com |
| Direct Energy Services, LLC<br>120 Wood Avenue, Suite 611<br>Iselin, NJ 08830 | (866) 547-2722<br><br>www.directenergy.com |
| FirstEnergy Solutions<br>300 Madison Avenue<br>Morristown, NJ 07962 | (800) 977-0500<br>Supply chain website<br>www.firstenergycorp.com/supplierregistration<br>www.fes.com |
| Glacial Energy of New Jersey, Inc.<br>207 LaRoche Avenue<br>Harrington Park, NJ 07640 | 1-877-569-2841<br><br>www.glacialenergy.com |
| Hess Corporation<br>1 Hess Plaza<br>Woodbridge, NJ 070956 | (800) 437-7872<br>Tom Miller<br>www.hess.com |
| Integrys Energy Services, Inc.<br>99 Wood Ave, South, Suite 802<br>Iselin, NJ 08830 | 1-877-763-9977<br>Dole Janssen: 920-617-6029<br>Charles Kuntz: 614-844-4324<br>www.integrysenergy.com |

| Supplier | Telephone & Web Site |
|---|---|
| Liberty Power Delaware, LLC<br>Park 80 West Plaza II, Suite 200<br>Saddle Brook, NJ 07663 | (866)769-3799<br>www.libertypowercorp.com |
| Liberty Power Holdings, LLC<br>Park 80 West Plaza II, Suite 200 | (866) 769-3799 |

| | |
|---|---|
| Saddle Brook, NJ 07663 | www.libertypowercorp.com |
| Palmco Power NJ, LLC<br>One Greentree Centre<br>10000 Lincoln Drive East, Suite 201<br>Marlton, NJ 08053 | (877) 726-5862<br><br>www.PalmcoEnergy.com |
| Pepco Energy Services, Inc.<br>112 Main Street<br>Lebanon, NJ 08833 | (800) ENERGY-9 (363-7499)<br><br>www.pepco-services.com |
| PPL Energy Plan, LLC<br>811 Church Road<br>Cherry Hill, NJ 08002 | 800-281-2000<br><br>www.pplenergyplus.com |
| Sempra Energy Solutions<br>The Mac-Cali Building<br>581 Main Street, 8th Floor<br>Woodbridge, NJ 07095 | (877) 273-6772<br>732-596-6400-Tony Buck<br>www.semprasolutions.com |
| South Jersey Energy Company<br>One South Jersey Plaza, Route 54<br>Folsom, NJ 08037 | (800) 756-3749<br>Gary Bean<br>gbean@sjindustries.com<br>www.southjerseyenergy.com |