ENERGY AUDIT – FINAL REPORT

LOPATCONG
Municipal Building

232 South 3rd Street
Phillipsburg, NJ 08865
ATTN: Betty Dobes

CEG PROPOSAL NO. 9C09058

CONCORD ENGINEERING GROUP

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Table of Contents

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I. EXECUTIVE SUMMARY

This report presents the findings of an energy audit conducted for:

Lopatcong Municipal Building
232 South Third Street
Phillipsburg, NJ 08865

Facility Contact Person: Betty Dobes

This audit was performed in connection with the New Jersey Clean Energy Local Government Energy Audit Program. These energy audits are conducted to promote the office of Clean Energy's mission, which is to use innovation and technology to solve energy and environmental problems in a way that improves the State's economy. This can be achieved through the wiser and more efficient use of energy.

The annual energy costs at this facility are as follows:

Electricity	$25,966
Natural Gas	$5,171
Total	$31,137

The potential annual energy cost savings are shown below in Table 1. The cost of each measure for this level of auditing is ± 20% until detailed engineering, specifications, and hard proposals are obtained.

Table 1
Energy Conservation Measures (ECM's)

ECM NO.	DESCRIPTION	COST[A]	ANNUAL SAVINGS[B]	SIMPLE PAYBACK (YEARS)	SIMPLE LIFETIME ROI
1	Install Lighting Controls	$2,850	$588	4.85	27.7%
2	Heat Pump split system Replacement	$45,588	$92	496	.2%
3	12.42 KW PV Solar Panel System	$111,780	$3,101	11.31	7.9%

Notes: A. Cost takes into consideration applicable NJ Smart Start™ incentives.
B. Savings takes into consideration applicable maintenance savings.

The estimated demand and energy savings are shown below in Table 2. The information in this table corresponds to the ECM's in Table 1.

Table 2
Estimated Energy Savings

ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECT DEMAND (KW)	ELECT CONSUMPTION (KWH)	NAT GAS (THERMS)
1	Install Lighting Controls	-	3,676	-
2	Heat Pump split system Replacement	-	568	-
3	12.42 KW PV Solar Panel System	12.42	19,382	-

Recommendation:

Concord Engineering Group (CEG) strongly recommends the implementation of all ECM's that provide a calculated simple payback at or under seven (7) years. The potential energy and cost savings from these ECM's are too great to pass upon. The following Energy Conservation Measures are recommended for the Lopatcong Township Municipal Building:

- **ECM #1:** Install Lighting Controls

CEG also recommends the Owner review the implementation of ECM #2: Heat Pump split system Replacement. This ECM is beneficial to the future operation of Lopatcong Municipal Building even though the simple payback is longer than the standard seven (7) year threshold and has not yet reached its ASHRAE service life. This ECM can be further reviewed at the end of its ASHRAE life and can possibly be a better investment in the near future.

II. INTRODUCTION

The Municipal Building is a 12,500 square foot facility that includes a meeting/court room, Mayor's office, court administrator office, tax collector/tax assessor offices, and clerk/building office. The first floor of the building is occupied by the Police Department which includes detectives office, holding areas, locker rooms, training room, fire prevention and the police chief's office.

Electrical and natural gas utility information is collected and analyzed for one full year's energy use of the building. The utility information allows for analysis of the building's operational characteristics; calculate energy benchmarks for comparison to industry averages, estimated savings potential, and baseline usage/cost to monitor the effectiveness of implemented measures. A computer spreadsheet is used to calculate benchmarks and to graph utility information (see the utility profiles below).

The Energy Use Index (EUI) is established for the building. Energy Use Index (EUI) is expressed in British Thermal Units/square foot/year (BTU/ft^2/yr), which is used to compare energy consumption to similar building types or to track consumption from year to year in the same building. The EUI is calculated by converting the annual consumption of all energy sources to BTU's and dividing by the area (gross square footage) of the building. Blueprints (where available) are utilized to verify the gross area of the facility. The EUI is a good indicator of the relative potential for energy savings. A low EUI indicates less potential for energy savings, while a high EUI indicates poor building performance therefore a high potential for energy savings.

Existing building architectural and engineering drawings (where available) are utilized for additional background information. The building envelope, lighting systems, HVAC equipment, and controls information gathered from building drawings allow for a more accurate and detailed review of the building. The information is compared to the energy usage profiles developed from utility data. Through the review of the architectural and engineering drawings a building profile can be defined that documents building age, type, usage, major energy consuming equipment or systems, etc.

The preliminary audit information is gathered in preparation for the site survey. The site survey provides critical information in deciphering where energy is spent and opportunities exist within a facility. The entire site is surveyed to inventory the following to gain an understanding of how each facility operates:

- Building envelope (roof, windows, etc.)
- Heating, ventilation, and air conditioning equipment (HVAC)
- Lighting systems and controls
- Facility-specific equipment

The building site visit is performed to survey all major building components and systems. The site visit includes detailed inspection of energy consuming components. Summary of building occupancy schedules, operating and maintenance practices, and energy management programs provided by the building manager are collected along with the system and components to determine a more accurate impact on energy consumption.

III. METHOD OF ANALYSIS

Post site visit work includes evaluation of the information gathered, researching possible conservation opportunities, organizing the audit into a comprehensive report, and making recommendations on HVAC, lighting and building envelope improvements. Data collected is processed using energy engineering calculations to anticipate energy usage for each of the proposed energy conservation measures (ECMs). The actual building's energy usage is entered directly from the utility bills provided by the owner. The anticipated energy usage is compared to the historical data to determine energy savings for the proposed ECMs.

It is pertinent to note, that the savings noted in this report are not additive. The savings for each recommendation is calculated as standalone energy conservation measures. Implementation of more than one ECM may in some cases affect the savings of each ECM. The savings may in some cases be relatively higher if an individual ECM is implemented in lieu of multiple recommended ECMs. For example implementing reduced operating schedules for inefficient lighting will result in a greater relative savings. Implementing reduced operating schedules for newly installed efficient lighting will result in a lower relative savings, because there is less energy to be saved. If multiple ECM's are recommended to be implemented, the combined savings is calculated and identified appropriately.

ECMs are determined by identifying the building's unique properties and deciphering the most beneficial energy saving measures available that meet the specific needs of the facility. The building construction type, function, operational schedule, existing conditions, and foreseen future plans are critical in the evaluation and final recommendations. Energy savings are calculated base on industry standard methods and engineering estimations. Energy consumption is calculated based on manufacturer's cataloged information when new equipment is proposed.

Cost savings are calculated based on the actual historical energy costs for the facility. Installation costs include labor and equipment to estimate the full up-front investment required to implement a change. Costs are derived from Means Cost Data, industry publications, and local contractors and equipment suppliers. The NJ Smart Start Building® program incentives savings (where applicable) are included for the appropriate ECM's and subtracted from the installed cost. Maintenance savings are calculated where applicable and added to the energy savings for each ECM. The life-time for each ECM is estimated based on the typical life of the equipment being replaced or altered. The costs and savings are applied and a simple payback, simple lifetime savings, and simple return on investment are calculated. See below for calculation methods:

$$Simple\ Payback = \left(\frac{Net\ Cost}{Yearly\ Savings} \right)$$

$$Simple\ Lifetime\ Savings = \left(Yearly\ Savings \times ECM\ \ Lifetime \right)$$

$$Simple\ Lifetime\ ROI = \frac{(Simple\ Lifetime\ Savings - Net\ Cost)}{Net\ Cost}$$

IV. HISTORIC ENERGY CONSUMPTION/COST

A. Energy Usage / Tariffs

Table 3 and Figure 1 represent the electrical usage for the surveyed facility from January-08 to December-08. Jersey Central Power and Light Company (JCP&L) provides electricity to the facility under the General Service Secondary rate. This electric rate has a component for consumption that is measured in kilowatt-hours (kWh). It is calculated by multiplying the wattage of the equipment times the hours that it operates. For example, a 1,000 Watt lamp operating for 5 hours would measure 5,000 Watt-hours. Since one kilowatt is equal to 1,000 Watts, the measured consumption would be 5 kWh. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the most current rate structure available.

Table 4 and Figure 2 show the natural gas energy usage for the surveyed facility from January-08 to December-08. Information recorded during the month of February and December is taken from 2009 and 2007, respectively. Elizabethtown Gas supplies the natural gas for the facility under their Small General Service Heat plan.

The average utility costs for the facility are as follows:

Description	Average
Electricity	16.2¢ / kWh
Natural Gas	$1.35 / Therm

Table 3
Electricity Billing Data

MONTH OF USE	CONSUMPTION KWH	DEMAND	TOTAL BILL
1/08	14,320	36	$2,142
2/09	14,080	34	$2,096
3/08	11,680	31	$1,699
4/08	11,200	37	$1,642
5/08	12,000	38	$1,753
6/08	15,120	57.6	$2,783
7/08	17,360	55	$3,154
8/08	15,280	48	$2,771
9/08	15,680	46	$2,753
10/08	10,720	40	$1,706
11/08	10,960	29	$1,706
12/08	11,760 [A]	35[A]	$1,762 [A]
Totals	**160,160**	**58 Max**	**$25,966**

Notes: A. Utility information for 12/08 is estimated; utility bill was not provided by Owner for this month.

Figure 1
Electricity Usage Profile

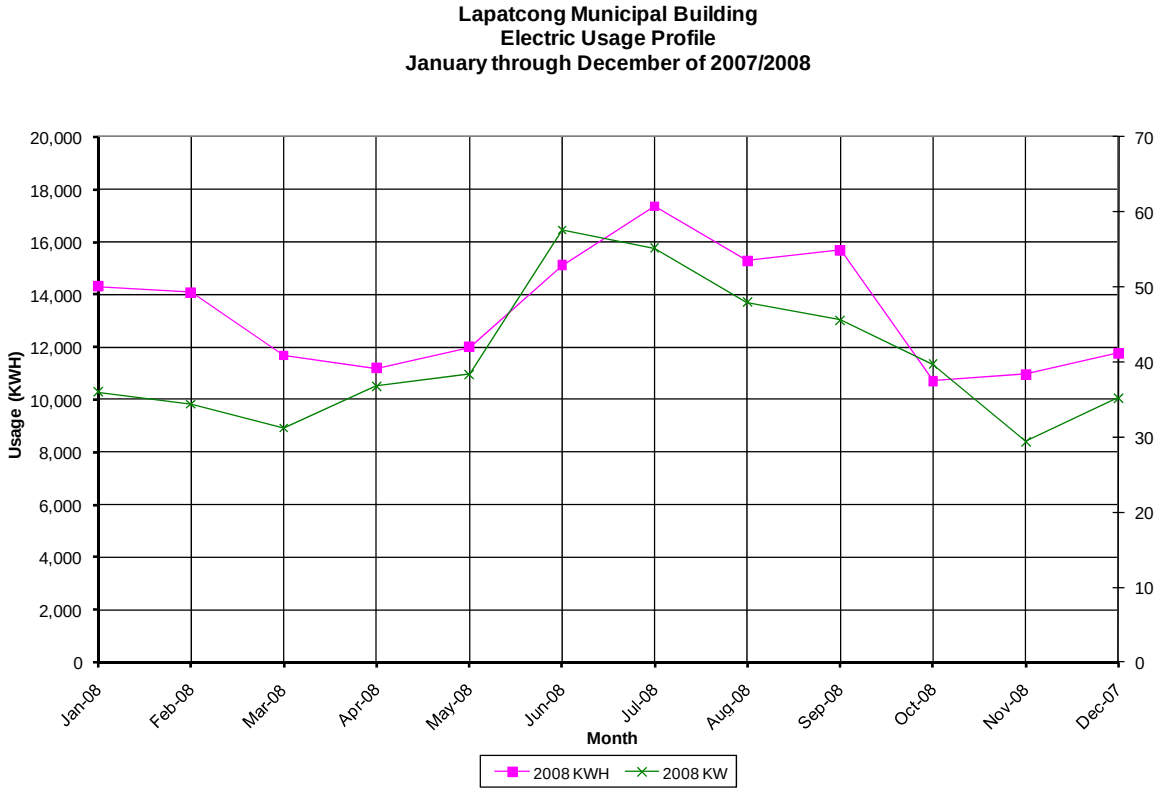
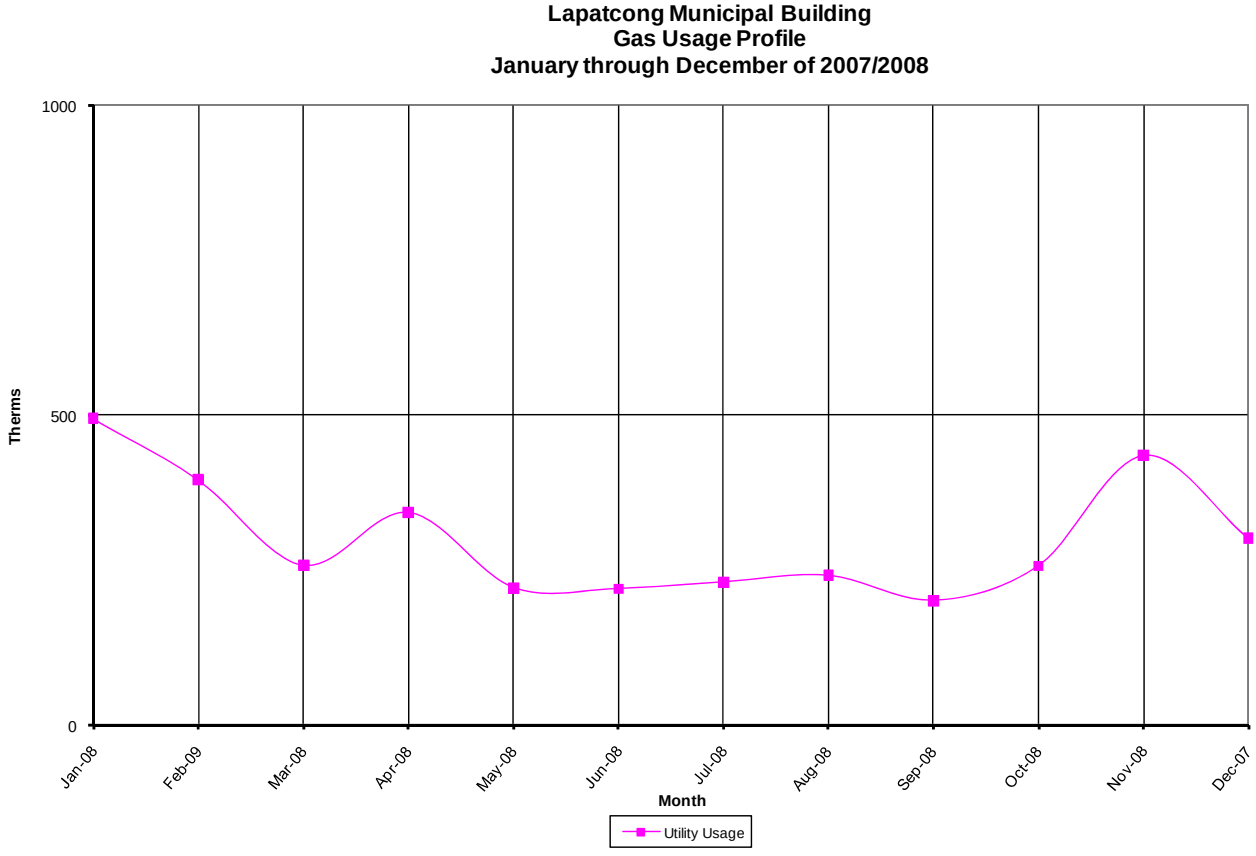


Table 4
Natural Gas Billing Data

MONTH OF USE	CONSUMPTION (THERMS)	TOTAL BILL
1/08	495.2	$702
2/09	395.7	$373
3/08	257.4	$373
4/08	343.4	$492
5/08	221.7	$323
6/08	220	$321
7/08	230.7[A]	$334.6[A]
8/08	241.3	$348
9/08	201	$312
10/08	257	$327
11/08	436	$525
12/07	301.5	$434
Totals	**3,601**	**$4,865**

Notes: A. Utility information for 7/08 is estimated; utility bill was not provided by Owner for this month.

Figure 2
Natural Gas Usage Profile



B. Energy Use Index (EUI)

The Energy Use Index is a measure of the total energy consumed in cooling and heating a building or facility in a year, expressed in British thermal units (Btu) per conditioned gross square footage.

$$Building\ \ EUI\ = \frac{(Electric\ \ Usage\ \ in\ \ kBtu\ + GasUsage\ in\ kBtu)}{Building\ \ \ Square\ \ Footage}$$

Electric = [(160,160) * (1000 W/kW) * (3.414 Btu/h / 1 W)]/ (1000 Btu/h / 1 kBtu/h)
= 546,786 kBtu

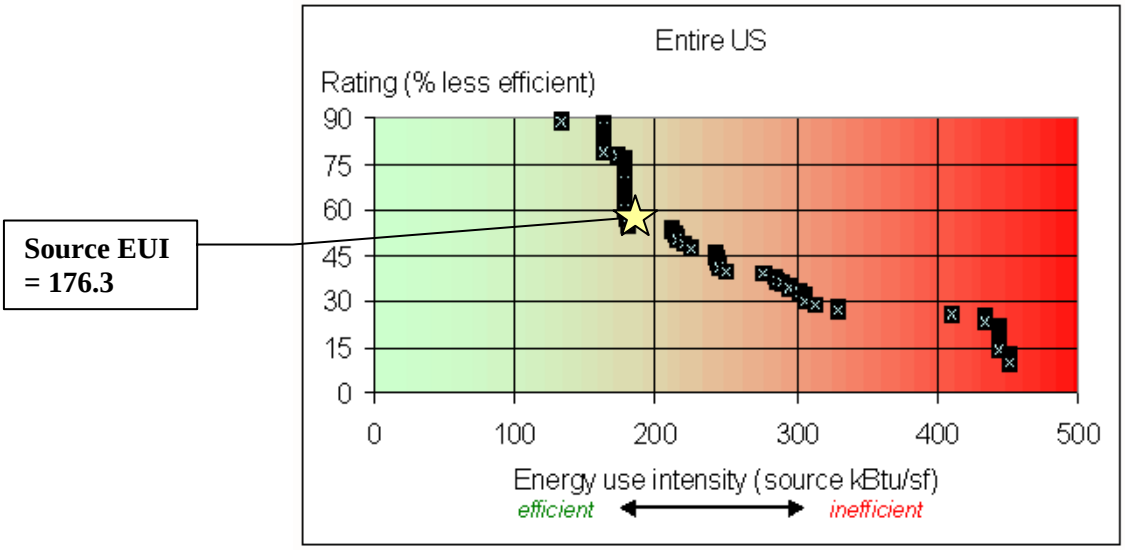
Natural Gas = ((3,601 therms) * (100,000 Btu/Therm)) / (1000 Btu/h / 1 kBtu/h) = 360,100 kBtu

EUI = (546,786 kBtu + 360,100 kBtu) / (12,500 SF)

Lopatcong Municipal Building EUI = 72.5 kBtu/SF (Site Energy); 176.3 kBtu/SF (Source Energy)

Table Figure 3 below depicts a national EUI grading for the source use of public order and safety buildings which include joint municipal and police facilities.

Figure 3
Source Energy Use Intensity Distributions: Public Order Buildings



C. EPA Energy Benchmarking System

The United States Environmental Protection Agency (EPA) in an effort to promote energy management has created a system for benchmarking energy use amongst various end users. The benchmarking tool utilized for this analysis is entitled Portfolio Manager. The Portfolio Manager tool allows you to track and assess energy consumption via the template forms located on the ENERGY STAR website (www.energystar.gov). The importance of benchmarking for local government municipalities is becoming more important as utility costs continue to increase and more emphasis is being placed throughout multiple arenas on carbon reduction, greenhouse gas emissions and other environmental impacts.

Based on information gathered from the ENERGY STAR website, Government agencies spend more than $10 billion a year on energy to provide public services and meet constituent needs. Furthermore, energy use in commercial buildings and industrial facilities is responsible for more than 50 percent of U.S. carbon dioxide emissions. Therefore, it is vital that local government municipalities assess their energy usage, benchmark this usage utilizing Portfolio Manager, set priorities and goals to lessen their energy usage and move forward with these priorites and goals. Saving energy will in-turn save the environement.

In accordance with the Local Government Energy Audit Program, CEG has created an Energy Star account for the municipality in order to allow the municipality access to monitoring their yearly energy usage as it compares to facilities of similar type. This account can be used to calculate the EUI which can be used to monitor the energy performance of the building. The account can be accessed at the following address; the username and password are also listed below:

https://www.energystar.gov/istar/pmpam/index.cfm?fuseaction=login.login

Username: lopatcongtwp
Password: lgeaceg2009

Utilizing the utility bills and other information gathered during the energy audit process, CEG entered the respective data into Portfolio Manager and the following is a summary of the results:

Table 4
ENERGY STAR Performance Rating

FACILITY DESCRIPTION	ENERGY PERFORMANCE RATING	NATIONAL AVERAGE
Municipal Building	39	72

Refer to Appendix D for detailed energy benchmarking report entitled “STATEMENT OF ENERGY PERFORMANCE.”

V. FACILITY DESCRIPTION

The Lopatcong Municipal Building is a two-story, brick faced building with wood construction. The first floor of the facility houses the police station and its associated offices while the second floor is occupied by the municipal facilities. This building is 12,500 square feet and was built in 1994. The municipal part of the building operates for 40 hours during a typical week while the police station operates 24 hours, 7 days a week. The building has a wood rafter or truss, wood sheathing, with asphalt shingles in excellent condition. The largest eligible roof surface is about 245 degrees West South West, with a total area partial to southern exposure of about 3,500 Square feet. The windows are double pane with wood frame. The Municipal Building consists of a meeting/court room, Mayor's office, court administrator office, tax collector/tax assessor offices, restrooms, and clerk/building office. The police station consists of a Detective office, evidence vault, processing room, holding area, squad room, locker rooms, exercise room, public assistant and reception area and bathrooms.

Heating System

The heating for the facilities is provided via two means; baseboard heating and Trane split system heating coils within the air handling units. All the heating coils are type W, two rows with fin type and are manufactured by Trane.

Domestic Hot Water

An A.O. Smith gas fired Conservationist 90' provides hot water for the facility. This unit has an input of 40,000 Btu/h and a recovery rate of 43.1 gallons per hour.

Cooling System

The facility is cooled via six (6) Trane split system heat pumps. These six (6) units vary in sizes ranging from 2.5 tons to 7.5 tons.

Controls System

The heating/cooling temperature of the building is controlled by six zone thermostats that control all of the areas of the building. The supplemental baseboard heating is controlled via several zone thermostats as well. The first floor police station has two zones of heating and the second floor municipal section has two zones as well.

Exhaust System

There are several centrifugal inline fans exhausting the bathroom, kitchen and locker room areas. The two (2) main inline exhaust fans are Penn Ventilator equivalent and are running 1/12 and ¼ horsepower motors. These fans are exhausting air via soffits out the side of the building.

Lighting

The building is lit by varying types and sizes of T-8 lights. Most of the wattages for the light fixtures are 32 Watts. The exit signs are newer units with LED technology.

VI. EQUIPMENT LIST

Following the completion of the field survey a detailed equipment list was created. The equipment within this list is considered major energy consuming equipment whose replacement could yield substantial energy savings. Additionally, the list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment if a manufactures date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Refer to Appendix E for the Major Equipment List.

VII. ENERGY CONSERVATION MEASURES

ECM #1: Install Lighting Controls

Description:

Install Lighting Controls to Reduce the Lighting Use

In some areas the lighting is left on unnecessarily. There has been a belief that it is better to keep the lights on rather than to continuously switch them on and off. This on/off dilemma was studied, and it was determined that the best option is to turn the lights off whenever possible. Although this practice reduces the lamp life, the energy savings far outweigh the lamp replacement costs.

Lighting controls are available in many forms. Lighting controls can be as simplistic as an additional switch. Timeclocks are often used which allow the user to set an on/off schedule. Timeclocks range from a dial clock with on/off indicators to a small box the size of a thermostat with user programs for on/off schedule in digital format. Occupancy sensors detect motion and will switch the lights on when the room is occupied. They can either be mounted in place of the current wall switch, or they can be mounted on the ceiling to cover large areas. Lastly, photocells are a lighting control that sense light levels and will turn the lights off when there is adequate daylight. These are mostly used outside, but they are becoming much more popular in energy-efficient office designs as well.

To determine an estimated savings for lighting controls, we used ASHRAE 90.1-2004 (NJ Energy Code). Appendix G states that occupancy sensors have a 10% power adjustment factor for daytime occupancies for buildings over 5,000 SF. CEG recommends the installation of dual technology occupancy sensors in all private offices, conference rooms, restrooms, lunch rooms, storage rooms, lounges, file rooms, etc.

From Appendix C of this report, we calculated the lighting power density (Watts/ft^2) of the existing municipal complex to be 13,450 Watts / 12,500 SF = 1.08 Watts/SF, although the calculation for the Watts/ SF needs to be broken up into two calculations due to the hours which the facilities are being occupied. The police station part of the building is a 24/7 facility while the rest of the building is only occupied 40 hours a week. Ten percent of this value is the resultant energy savings due to installation of occupancy sensors:

Police Station:

10% x 1.28 Watts/SF x 3,011 SF x 4,368 hrs/yr.

= 1,683 kWh x $0.16Wh

Municipal Offices/ facilities:

10% x 1.01 Watts/SF x 9,489 SF x 2,080 hrs/yr.

= 1,993 kWh x $0.16Wh

Savings = $588 / yr

Installation cost per dual-technology sensor (Basis: Sensorswitch or equivalent) is $75/unit including material and labor. The SmartStart Buildings® incentive is $20 per control which equates to an installed cost of $55/unit. Total number of rooms to be retrofitted is 38. Total cost to install sensors is $55/unit x 38 units = $330.

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,850
NJ Smart Start Equipment Incentive ($):	($760)
Net Installation Cost ($):	$2,090
Maintenance Savings ($ / yr):	*$0*
Energy Savings ($ / yr):	*$588*
Total Yearly Savings ($ / yr):	*$588*
Simple Payback (yrs):	*3.6*
Simple Lifetime ROI (%):	*603.3%*
Estimated ECM Lifetime (yr):	*25*
Simple Lifetime Savings ($):	*$14,700*

ECM #2: Heat Pump Replacement

Description:

There are several split heat pump systems that are using electric resistance coils and R-22 refrigerant. Additionally, these units are also very close to approaching their ASHRAE service life.

This measure would replace all aged split heat pump units with high-efficiency split heat pump units.

The following assumptions are used in the savings analysis below:

- The existing energy rating of the aged split heat pump units is an average of 10.1 EER.
- The energy efficiency rating of the new heat pump units is 11.2 EER

Method for Calculating Summer Energy Savings:

Gross annual energy savings = Units x Tons/Unit x RLF x $[12/EER_{exist} - 12/EER_{new}]$ x CLH

Where:

RLF = the ***rated load factor*** which is the ratio of the peak cooling load imposed on the cooling equipment to the total rated cooling capacity. This factor compensates for oversizing of the air conditioning unit. Recommended value is 0.8.

CLH = ***Cooling load hours*** are defined as the ration of the annual cooling load to the peak cooling load. The cooling load hours for Phillipsburg, NJ area is 497.

Energy Savings = 36 Tons x 0.8 x [12/10.1 – 12/11.2] x 497 = 568 kWh

Energy cost savings = 568 kWh x $0.162/kWh = $92

Cost of seven (7) high-efficiency split heat pumps is $48,900. The SmartStart Buildings® incentive is $3,312 which equates to a net installed cost of $45,588.

Simple Payback = 496 years

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$48,900
NJ Smart Start Equipment Incentive ($):	($3,312)
Net Installation Cost ($):	$45,588
Maintenance Savings ($ / yr):	*$0*
Energy Savings ($ / yr):	*$92*
Total Yearly Savings ($ / yr):	*$92*
Simple Payback (yrs):	*496*
Simple Lifetime ROI (%):	*-96.9%*
Estimated ECM Lifetime (yr):	*15*
Simple Lifetime Savings ($):	*$1,380*

VIII. RENEWABLE/DISTRIBUTED ENERGY MEASURES

Globally, renewable energy has become a priority affecting international and domestic energy policy. The State of New Jersey has taken a proactive approach, and has recently adopted in its Energy Master Plan a goal of 30% renewable energy by 2020. To help reach this goal New Jersey created the Office of Clean Energy under the direction of the Board of Public Utilities and instituted a Renewable Energy Incentive Program to provide additional funding to private and public entities for installing qualified renewable technologies. A renewable energy source can greatly reduce a building's operating expenses while producing clean environmentally friendly energy. CEG has assessed the feasibility of installing renewable energy technologies for Branchburg NJ, and concluded that there is potential for solar energy generation.

Solar energy produces clean energy and reduces a building's carbon footprint. This is accomplished via photovoltaic panels which will be mounted on all south and southwestern facades of the building. Flat roof, as well as sloped areas can be utilized; flat areas will have the panels turned to an optimum solar absorbing angle. (A structural survey of the roof would be necessary before the installation of PV panels is considered). The state of NJ has instituted a program in which one Solar Renewable Energy Certificate (SREC) is given to the Owner for every 1000 kWh of generation. SREC's can be sold anytime on the market at their current market value. The value of the credit varies upon the current need of the power companies. The average value per credit is around $350, this value was used in our financial calculations. This equates to $0.35 per kWh generated.

CEG has reviewed the existing roof area of the building being audited for the purposes of determining a potential for a roof mounted photovoltaic system. A roof area of 788 S.F. can be utilized for a PV system. A depiction of the area utilized is shown in Renewable / Distributed Energy Measures Calculation appendix. Using this square footage it was determined that a system size of 12.42 kilowatts could be installed. A system of this size has an estimated kilowatt hour production of 19,382 KWh annually, reducing the overall utility bill by approximately 11.9% percent. A detailed financial analysis can be found in the Renewable / Distributed Energy Measures Calculation appendix. This analysis illustrates the payback of the system over a 25 year period. The eventual degradation of the solar panels and the price of accumulated SREC's are factored into the payback.

The solar panel system analysis is based on Sun Power SPR-230 panels. The panel efficiency is 18% with an inverter efficiency of 95%. This region allows for a typical range of sunlight between 4.5 and 4.9 hours per day. The calculations are based on an average 4.68 hours per day. The operating hours are calculated based on 351 days per year accounting for two weeks per year of service down time. The calculations are also based on a solar PV system which utilizes the New Jersey guidelines for net metering. Net metering allows excess energy generated at production peaks to flow onto the grid. The excess energy is metered and subtracted from the facility's total energy usage on an annual basis. Due to this allowance the system design excludes the use of inefficient battery storage.

CEG has reviewed financing options for the owner. Two options were studied and they are as follows: Self-financed and direct purchase without finance. Self-finance was calculated with 95% of the total project cost financed at a 7% interest rate over 25 years. Direct purchase involves the

local government paying for 100% of the total project cost upfront via one of the methods noted in the Installation Funding Options section below. Both of these calculations include a utility inflation rate as well as the degradation of the solar panels over time. Based on our calculations the following are the payback periods for the respective method of payment:

PAYMENT TYPE	SIMPLE PAYBACK	INTERNAL RATE OF RETURN
Self-Finance	11.31 Years	11.9%
Direct Purchase	11.31 Years	7.9%

The above information is concluded as ECM #3 showing installation costs, energy savings and other pertinent summarized information in section I of this report.

The resultant Internal Rate of Return indicates that if the Owner was able to "self-finance" the solar project, the project would be slightly more beneficial to the Owner. However, if the Owner was able to work out a Power Purchase Agreement with a third-party and agree upon a decent base energy rate for kilowatt hour production, the "direct purchase" option could also, prove to be a beneficial route.

In addition to the Solar Analysis, CEG also conducted a review of the applicability of wind energy for the facility. Wind energy production is another option available through the Renewable Energy Incentive Program. Wind turbines of various types can be utilized to produce clean energy on a per building basis. Cash incentives are available per kWh of electric usage. Based on CEG's review of the applicability of wind energy for the facility, it was determined that the average wind speed is not adequate, and the kilowatt demand for the building is below the threshold (200 kW) for purchase of a commercial wind turbine. Therefore, wind energy is not a viable option to implement.

IX. ENERGY PURCHASING AND PROCUREMENT STRATEGY

Load Profile:

Load Profile analysis was performed to determine the seasonal energy usage of the facility. Irregularities in the load profile will indicate potential problems within the facility. Consequently based on the profile a recommendation will be made to remedy the irregularity in energy usage. For this report, the facility's energy consumption data was gathered in table format and plotted in graph form to create the load profile. Refer to Section IV, Figures 1 and 2 included within this report to reference the respective electricity and natural gas usage load profile for the date range of the data provided by the Owner.

Electricity:

Section IV, Figure 1 demonstrates a fairly flat (base-load) electric profile. The summer (June-September) is a typical load caused by air conditioning with some increased consumption. The balance of the year is very flat. There is a drop-off in electric use beginning February and falling to its lowest point in April and October. This base-load shaping is important because a flat consumption profile will yield more competitive energy prices when procuring energy.

Natural Gas:

Section IV, Figure 2 demonstrates a very flat natural gas usage profile throughout the year. This is not typical. This very flat load shaping will be very helpful when procuring energy. The base-load shaping (flat) will secure more competitive energy prices when procuring through an alternative energy source.

Tariff Analysis:

Electricity:

This facility receives electrical service through Jersey Central Power & Light (JCP&L) on a GSS (General Service Secondary) rate. Service classification GS is available for general service purposes on secondary voltages not included under Service Classifications RS, RT, RGT or GST. This is a single or three phase service at secondary voltages. For electric supply (generation), the customer will use the utilities Basic Generation Service (BGS) or a Third Party Supplier (TPS). If they use the utility BGS then they will pay according to the BGS default service. The Delivery Service includes the following charges: Customer Charge, Supplemental Customer Charge, Distribution Charge (kW Demand), kWh Charge, Non-utility Generation Charge, TEFA, SBC, SCC, Standby Fee and RGGI

Natural Gas:

The Municipal Building receives natural gas service through Elizabethtown Gas Company (Etown) on a SGS, (Small General Service) utility rate when not receiving commodity by a Third Party Supplier. The utility tariff rate SGS is available to those customers whose annual weather annualized usage as determined by the utility is less than 3,000 therms per year and where Gas

Company's facilities are suitable and the quantity of gas is available for the service desired. In August of each year the Gas Company shall re-determine each customer's eligibility based on their annual normalized usage.

This is a Continuous service with the following monthly charges: Service Charge, Distribution Charge and Commodity Charge as determined by Rider "A", and Monthly Service Charge.

Imbalances occur when Third Party Suppliers are used to supply natural gas, full-delivery is not made, and when a new supplier is contracted or the customer returns to the utility. It is important when utilizing a Third Party Supplier, that an experienced regional supplier is used. Otherwise, imbalances can occur, jeopardizing economics and scheduling.

From review of the information provided, it appears that Lopatcong can improve its natural gas costs by about 20% as per current market rates.

Recommendations:

CEG recommends a global approach that will be consistent with all facilities within the Township. CEG's primary observation is seen in the electric costs. The average price per kWh (kilowatt hour) for all buildings based on 1-year historical average price is $.145/kWh (kWh is the common unit of electric measure). The average price per decatherm for natural gas is $ 10.5 / dth (dth, is the common unit of measure). Energy commodities are among the most volatile of all commodities, however at this point and time, energy is extremely competitive. The Township could see improvement in its energy costs if it were to take advantage of these current market prices quickly, before energy increases. Based on annual historical consumption (January through December 2008) and current electric rates, the Township could see an improvement in its electric costs of up to 25% annually. (Note: Savings were calculated using Lopatcong's Average Annual Consumption and a variance to a Fixed Average One-Year commodity contract). CEG recommends aggregating the entire electric load to gain the most optimal energy costs. CEG recommends advisement for alternative sourcing and supply of energy on a "managed approach".

CEG's secondary recommendation coincides with Lopatcong's natural gas costs. Based on the current market, Lopatcong could improve its natural gas costs up to 25% annually. CEG recommends further advisement on these prices. The Township should also consider procuring energy (natural gas) through alternative supply sources. CEG recommends energy advisory services.

CEG also recommends that the city schedule a meeting with their current utility providers to review their utility charges and current tariff structures for electricity and natural gas. This meeting would provide insight regarding alternative procurement options that are currently available. Through its meeting with the Local Distribution Company (LDC), the city will learn more about the competitive supply process. Loptacong can acquire a list of approved Third Party Suppliers from the New Jersey Board of Public Utilities website at www.nj.gov/bpu, and should also consider using a billing-auditing service to further analyze the utility invoices, manage the data and use the data to manage ongoing demand-side management projects. Furthermore, CEG recommends special attention to credit mechanisms, imbalances, balancing charges and commodity charges when meeting with their utility representative. In addition, they should also ask the utility representative about alternative

billing options. Some utilities allow for consolidated billing options when utilizing the service of a Third Party Supplier.

Finally, if Lopatcong changes or plans on changing its supplier for energy (natural gas), it needs to closely monitor balancing, particularly when the contract is close to termination. This could be performed with the aid of an “energy advisor”.

X. INSTALLATION FUNDING OPTIONS

CEG has reviewed various funding options for the Owner to utilize in subsidizing the costs for installing the energy conservation measures noted within this report. Below are a few alternative funding methods:

i. *Energy Savings Improvement Program (ESIP)* – Public Law 2009, Chapter 4 authorizes government entities to make energy related improvements to their facilities and par for the costs using the value of energy savings that result from the improvements. The "Energy Savings Improvement Program (ESIP)" law provides a flexible approach that can allow all government agencies in New Jersey to improve and reduce energy usage with minimal expenditure of new financial resources.

ii. *Municipal Bonds* – Municipal bonds are a bond issued by a city or other local government, or their agencies. Potential issuers of municipal bonds include cities, counties, redevelopment agencies, school districts, publicly owned airports and seaports, and any other governmental entity (or group of governments) below the state level. Municipal bonds may be general obligations of the issuer or secured by specified revenues. Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued, although municipal bonds issued for certain purposes may not be tax exempt.

iii. *Power Purchase Agreement* – Public Law 2008, Chapter 3 authorizes contractor of up to fifteen (15) years for contracts commonly known as "power purchase agreements." These are programs where the contracting unit (Owner) procures a contract for, in most cases, a third party to install, maintain, and own a renewable energy system. These renewable energy systems are typically solar panels, windmills or other systems that create renewable energy. In exchange for the third party's work of installing, maintaining and owning the renewable energy system, the contracting unit (Owner) agrees to purchase the power generated by the renewable energy system from the third party at agreed upon energy rates.

CEG recommends the Owner review the use of the above-listed funding options in addition to utilizing their standard method of financing for facilities upgrades in order to fund the proposed energy conservation measures.

XI. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures with attractive paybacks. These measures are not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils in the window AC units periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%. The 3-step process includes cleaning of the coils, rinsing and a micro biocide treatment. Thoroughly cleaned coils are not as susceptible to re-fouling so they stay clean longer, reducing the cleaning cycle frequency

B. Maintain all weather stripping on windows and doors.

C. Use cog-belts instead of v-belts on all belt-driven fans, etc. These can reduce electrical consumption of the motor by 2-5%.

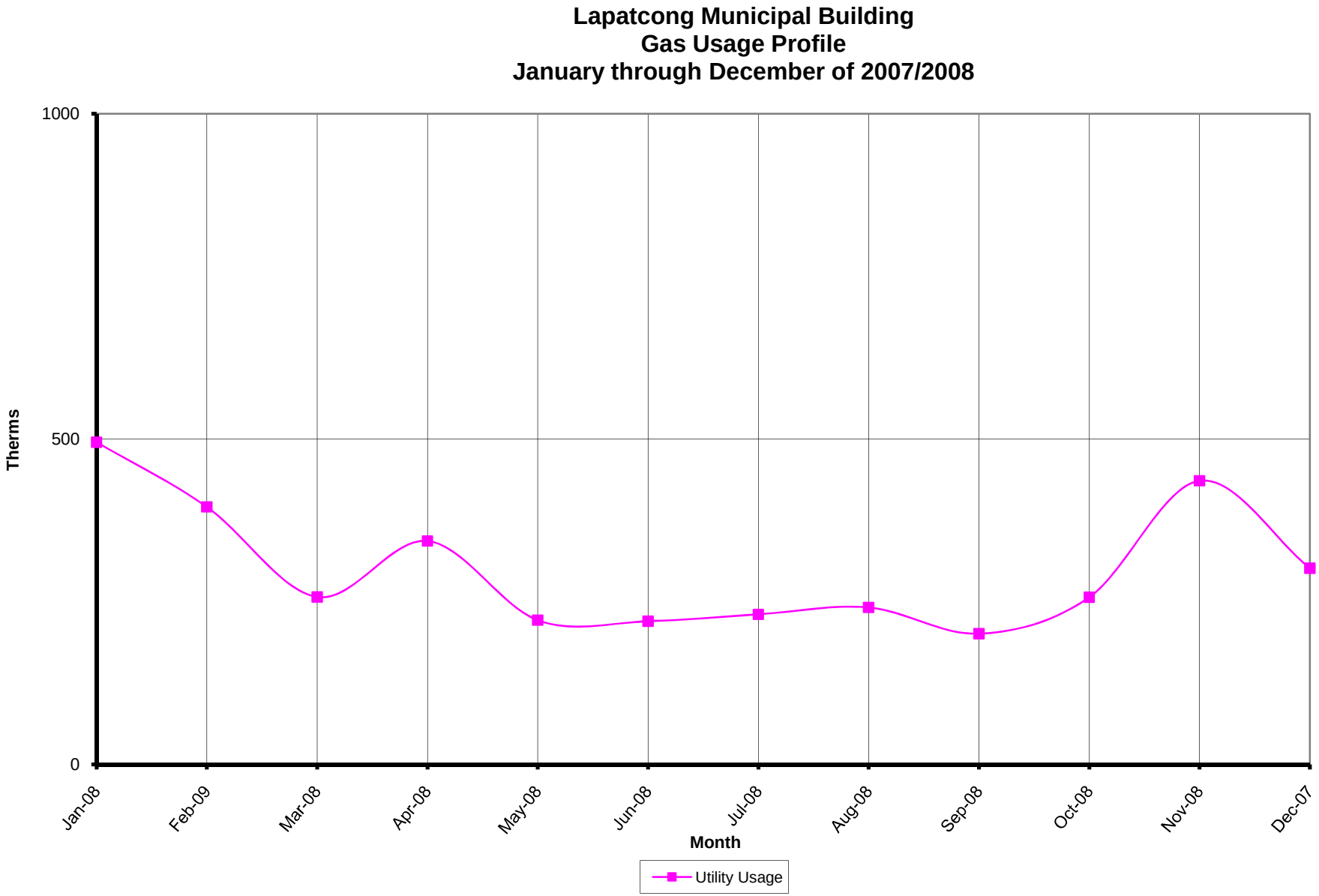
D. Repair/replace damaged or missing ductwork insulation in the ceiling spaces.

E. Provide more frequent air filter changes to decrease overall fan horsepower requirements and maintain better IAQ.

F. Recalibrate existing zone thermostats.

G. Clean all fixtures to maximize light output.

H. Feel for air drafts around electrical outlets. Inexpensive pads are available, as are plugs for unused sockets.


Lapatcong Municipal Building
Gas Usage Profile
January through December of 2007/2008
1000
500
0
Therms
Jan-08
Feb-09
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-07
Month
Utility Usage

Summary of Natural Gas Cost

Elizabethtown Gas - Small General Service Heat

Project #9C08143

232 3rd Street, Back, Phillipsburg NJ, 08865

2008

Project #9C08143

Municipal Building

Account: 0098016641

Meter: 0035958

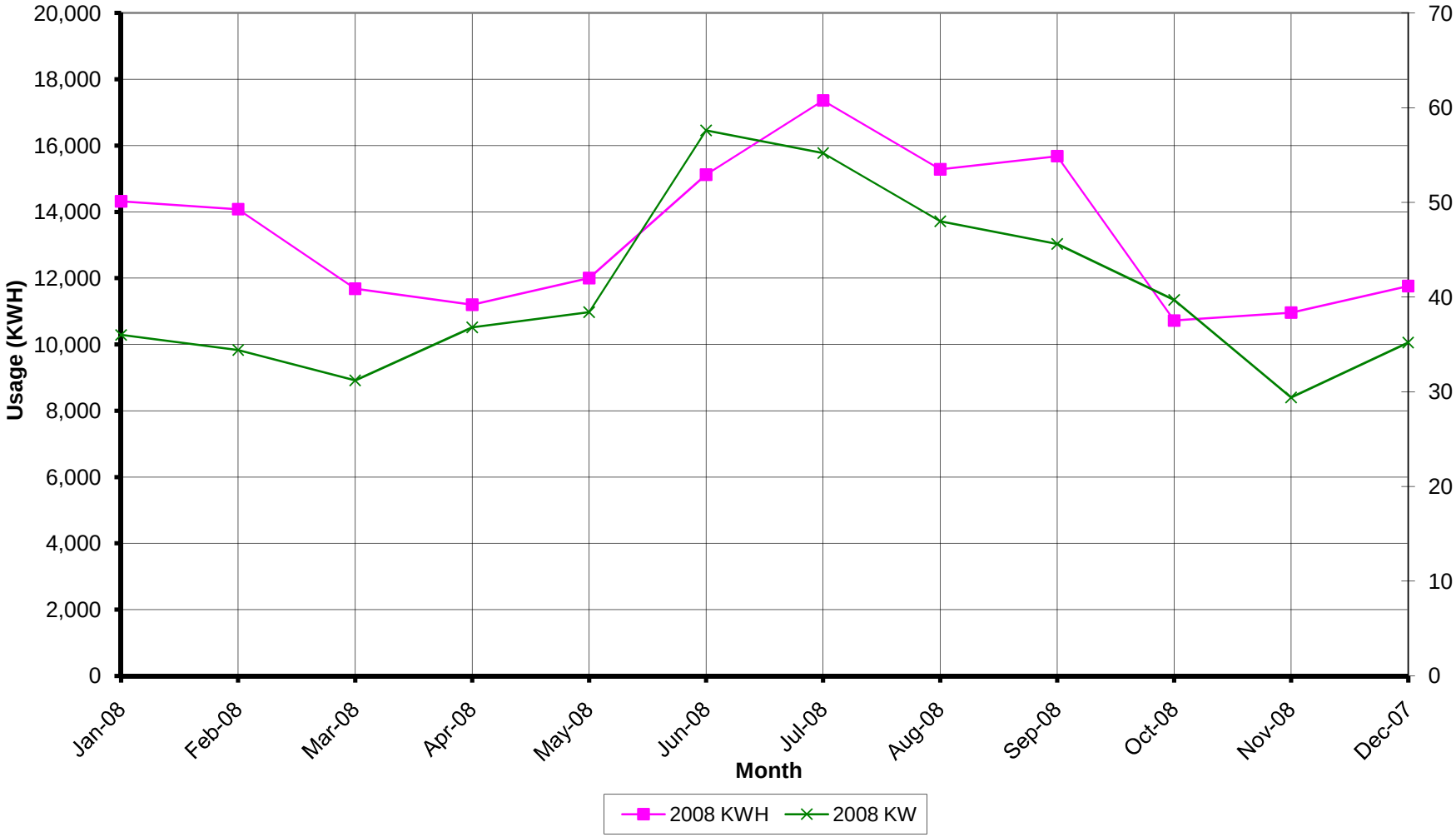
Month	Jan-08	Feb-09	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-07	**Total**	
Billing Days	31	28	31	30	31	30	31	31	30	31	30	31		
Therms (Burner Tip)	495.2	395.7	257.4	343.4	221.7	220.0	230.7	241.3	201.0	257.0	436.0	301.5	3600.9	
Total Distribution Cost	$190	$116	$107	$137	$94	$93	96.1	$99	$86	$80	$126	$122	1,345	Utility Charge
Cost per Therm	$0.384	$0.292	$0.414	$0.398	$0.424	$0.425	0.4	$0.409	$0.426	$31.060	$0.289	$0.405	$0.374	
Total Commodity Cost	$512	257.48	$266	$355	$229	$227	238.5	$249	$226	$247	$399	$312	3,519	Current Charge
Cost per Therm	$1.03	$0.65	$1.03	$1.03	$1.03	$1.03	1.0	$1.03	$1.13	$56.23	$0.92	$1.03	$0.98	
Total Cost	$702	373.14	$373	$492	$323	$321	334.6	$348	$312	$327	$525	$434	$4,865	
Cost per Therm	$1.418	$0.943	$1.448	$1.432	$1.458	$1.459	1.5	$1.443	$1.552	$1.273	$1.204	$1.439	**$1.351**	

.=2009 utility information used.

.=2007 utility information used

.= No Utility Information Provided

Lapatcong Municipal Building
Electric Usage Profile
January through December of 2007/2008



Electric Cost Summary

JCP&L

232 3rd St, Phillipsburg NJ, 08865

Project #9C08143

Municipal Building **2008**

Account # 100005540008

Meter # ----------

Month	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-07	**Total**	
Billing Days	31	28	31	30	31	30	31	31	30	31	30	31	0	
KWH	14,320	14,080	11,680	11,200	12,000	15,120	17,360	15,280	15,680	10,720	10,960	11,760	160,160	
KW	36	34	31	37	38	57.6	55	48	46	40	29	35	58	Max
Monthly Load Factor	53%	61%	50%	42%	42%	36%	42%	43%	48%	36%	52%	45%	46%	
Electric Cost, $	$ 2,142	$ 2,096	$ 1,699	$ 1,642	$ 1,753	$ 2,783	$ 3,154	$ 2,771	$ 2,753	$ 1,706	$ 1,706	$ 1,762	$25,966	
$/KWH	$0.150	$0.149	$0.145	$0.147	$0.146	$0.184	$0.182	$0.181	$0.176	$0.159	$0.156	$0.150	**$0.162**	

ENERGY TYPE	BUILDING USE			SITE ENERGY	SITE-SOURCE	SOURCE ENERGY
	kWh	Therms	Gallons	kBtu	RATIO	kBtu
ELECTRIC	160,160			546,786	3.340	1,826,266
NATURAL GAS		3,600.85		360,085	1.047	377,009
FUEL OIL			0.00	0	1.010	0
PROPANE			0.00	0	1.010	0
TOTAL				906,871		2,203,275
*Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued Dec 2007.						
BUILDING AREA		12,500		SQUARE FEET		
BUILDING SITE EUI		72.55		kBtu/SF/YR		
BUILDING SOURCE EUI		**176.26**		**kBtu/SF/YR**		

DETAILED COST BREAKDOWN PER ECM

CONCORD ENGINEERING GROUP

Lopatcong Municipal Building

ECM 1 Interior Lighting Controls

	Qty	Unit Cost $	Material $	Labor $	Total $
Dual - Technology Sensor	38	$75	$1,140	$1,710	$2,850
Total Cost			$1,140	$1,710	$2,850
Utility Incentive - NJ Smart Start ($20 per Sensor)					($760)
Total Cost Less Incentive					$2,090

ECM 2 High Efficiency Split System Heat Pump Replacement

	Qty	Unit Cost $	Material $	Labor $	Total $
New 7.5-Ton Split System Heat Pump	3	$10,500	$0	$0	$31,500
New 5-Ton Split System Heat Pump	1	$7,000	$0	$0	$7,000
New 5-Ton Split System Heat Pump	1	$6,000	$0	$0	$6,000
New 2.5-Ton Split System Heat Pump	1	$3,000	$0	$0	$3,000
New 1-Ton Split System Heat Pump	1	$1,400	$0	$0	$1,400
Total Cost			$0	$0	$48,900
Smart Start® Incentive ($92/Ton)	36				($3,312)
Total Cost Less Incentive					$45,588

ECM 3 12.42 KW PV Solar System

	Qty	Unit Cost $	Material $	Labor $	Total $
Conergy Photovoltaic Modules	54	$2,070	$0	$0	$111,780
Total Cost					$111,780

Concord Engineering Group, Inc.

520 BURNT MILL ROAD
VOORHEES, NEW JERSEY 08043
PHONE: (856) 427-0200
FAX: (856) 427-6508

SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives as of January, 2009:

Electric Chillers

Water-Cooled Chillers	$12 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Gas Cooling

Gas Absorption Chillers	$185 - $400 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

	$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $93 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250

Ground Source Heat Pumps

Closed Loop & Open Loop	$370 per ton

Gas Heating

Gas Fired Boilers < 300 MBH	$300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$300 - $400 per unit

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps	$60 per hp
Compressors	$5,250 to $12,500 per drive

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons	$50 per unit
Gas-Fired Water Heaters >50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH

Premium Motors

Three-Phase Motors	$45 - $700 per motor

Prescriptive Lighting

T-5 and T-8 Lamps w/Electronic Ballast in Existing Facilities	$10 - $30 per fixture, (depending on quantity)
Hard-Wired Compact Fluorescent	$25 - $30 per fixture
Metal Halide w/Pulse Start	$25 per fixture
LED Exit Signs	$10 - $20 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $284 per fixture

Lighting Controls – Occupancy Sensors

Wall Mounted	$20 per control
Remote Mounted	$35 per control
Daylight Dimmers	$25 per fixture
Occupancy Controlled hi-low Fluorescent Controls	$25 per fixture controlled

Lighting Controls – HID or Fluorescent Hi-Bay Controls

Occupancy hi-low	$75 per fixture controlled
Daylight Dimming	$75 per fixture controlled

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2004 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Municipal Building

Building ID: 1792091
For 12-month Period Ending: December 31, 2008[1]
Date SEP becomes ineligible: N/A
Date SEP Generated: August 18, 2009

Facility
Municipal Building
232 South Third Street
Phillipsburg, NJ 08865

Facility Owner
Lopatcong Township
232 South Third Street
Phillipsburg, NJ 08865

Primary Contact for this Facility
Ray Johnson
520 South Burnt Mill Road
Voorhees, NJ 08043

Year Built: 1994
Gross Floor Area (ft²): 12,500

Energy Performance Rating[2] (1-100) 39

Site Energy Use Summary[3]

Natural Gas (kBtu)[4]	360,090
Electricity (kBtu)	546,466
Total Energy (kBtu)	906,556

Energy Intensity[5]

Site (kBtu/ft²/yr)	73
Source (kBtu/ft²/yr)	176

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	102

Electric Distribution Utility
Jersey Central Power & Lt Co

National Average Comparison

National Average Site EUI	65
National Average Source EUI	157
% Difference from National Average Source EUI	12%
Building Type	Courthouse

Stamp of Certifying Professional

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

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

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

Certifying Professional
Ray Johnson
520 South Burnt Mill Road
Voorhees, NJ 08043

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.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.
NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Municipal Building	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Courthouse	Is this an accurate description of the space in question?		☐
Location	232 South Third Street, Phillipsburg, NJ 08865	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Municipal Building (Courthouse)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	12,500 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	40 Hours	Is this the total number of hours per week that the Courthouse is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	25	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐
Number of PCs	25	Is this the number of personal computers in the Courthouse?		☐
Percent Cooled	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Jersey Central Power & Lt Co

Fuel Type: Electricity		
Meter: Electric Municipal (kWh (thousand Watt-hours)) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
12/01/2008	12/31/2008	11,760.00
11/01/2008	11/30/2008	10,960.00
10/01/2008	10/31/2008	10,720.00
09/01/2008	09/30/2008	15,680.00
08/01/2008	08/31/2008	15,280.00
07/01/2008	07/31/2008	17,360.00
06/01/2008	06/30/2008	15,120.00
05/01/2008	05/31/2008	12,000.00
04/01/2008	04/30/2008	11,200.00
03/01/2008	03/31/2008	11,680.00
02/01/2008	02/29/2008	14,080.00
01/01/2008	01/31/2008	14,320.00
Electric Municipal Consumption (kWh (thousand Watt-hours))		**160,160.00**
Electric Municipal Consumption (kBtu)		**546,465.92**
Total Electricity Consumption (kBtu)		**546,465.92**
Is this the total Electricity consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas		
Meter: Gas Municipal (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
12/01/2008	12/31/2008	301.50
11/01/2008	11/30/2008	436.00
10/01/2008	10/31/2008	257.00
09/01/2008	09/30/2008	201.00
08/01/2008	08/31/2008	241.30
07/01/2008	07/31/2008	230.70
06/01/2008	06/30/2008	220.00
05/01/2008	05/31/2008	221.70
04/01/2008	04/30/2008	343.40

03/01/2008	03/31/2008	257.40
02/01/2008	02/29/2008	395.70
01/01/2008	01/31/2008	495.20
Gas Municipal Consumption (therms)		**3,600.90**
Gas Municipal Consumption (kBtu)		**360,090.00**
Total Natural Gas Consumption (kBtu)		**360,090.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

Certifying Professional

(When applying for the ENERGY STAR, this must be the same PE that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
Municipal Building
232 South Third Street
Phillipsburg, NJ 08865

Facility Owner
Lopatcong Township
232 South Third Street
Phillipsburg, NJ 08865

Primary Contact for this Facility
Ray Johnson
520 South Burnt Mill Road
Voorhees, NJ 08043

General Information

Municipal Building	
Gross Floor Area Excluding Parking: (ft^2)	12,500
Year Built	1994
For 12-month Evaluation Period Ending Date:	December 31, 2008

Facility Space Use Summary

Municipal Building	
Space Type	Courthouse
Gross Floor Area(ft^2)	12,500
Weekly operating hours	40
Workers on Main Shift	25
Number of PCs	25
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 12/31/2008)	**Baseline** (Ending Date 12/31/2008)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	39	39	75	N/A	50
Energy Intensity					
Site (kBtu/ft^2)	73	73	48	N/A	65
Source (kBtu/ft^2)	176	176	116	N/A	157
Energy Cost					
$/year	$ 30,831.60	$ 30,831.60	$ 20,309.23	N/A	$ 27,455.94
$/$ft^2$/year	$ 2.47	$ 2.47	$ 1.63	N/A	$ 2.20
Greenhouse Gas Emissions					
$MtCO_2e$/year	102	102	67	N/A	91
$kgCO_2e/ft^2$/year	8	8	5	N/A	7

More than 50% of your building is defined as Courthouse. Please note that your rating accounts for all of the spaces listed. The National Average column presents energy performance data your building would have if your building had an average rating of 50.

Notes:
o - This attribute is optional.
d - A default value has been supplied by Portfolio Manager.

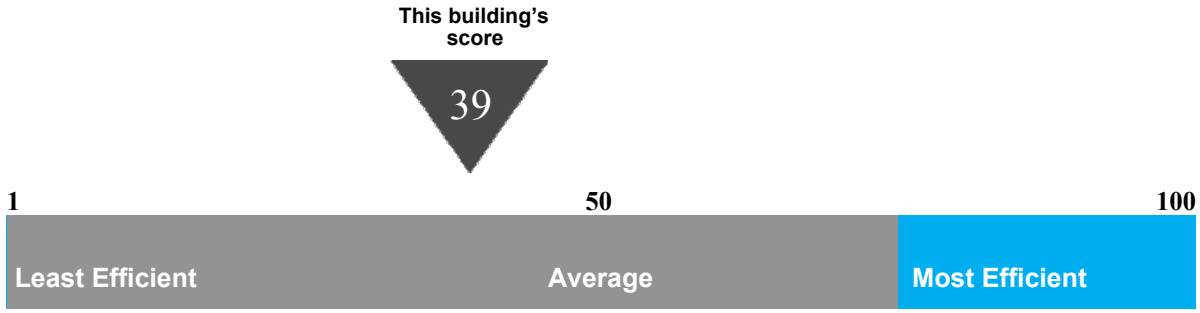
Statement of Energy Performance

2008

Municipal Building
232 South Third Street
Phillipsburg, NJ 08865

Portfolio Manager Building ID: 1792091

The energy use of this building has been measured and compared to other similar buildings using the Environmental Protection Agency's (EPA's) Energy Performance Scale of 1–100, with 1 being the least energy efficient and 100 the most energy efficient. For more information, visit energystar.gov/benchmark.



This building uses 176 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending December 2008

Buildings with a score of 75 or higher may qualify for EPA's ENERGY STAR.

I certify that the information contained within this statement is accurate and in accordance with U.S. Environmental Protection Agency's measurement standards, found at energystar.gov

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 08/18/2009

MAJOR EQUIPMENT LIST

Concord Engineering Group

"Lopatcong Municipal Building"

Boiler

Location	Manufacturer	Qty.	Model #	Serial #	Input (MBh)	Output (MBh)	Efficiency (%)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Boiler Room	Weil Mclain	1	80	-	1082	872	80	Nat. Gas	2	35	33	

Boiler - Burner

Location	Manufacturer	Qty.	Model #	Serial #	Input (MBh)	Efficiency (%)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Boiler Room	Gordon Platt	1	WR8 1-G-07	-	1084	80	Nat. Gas	12	21	9	

Boiler - Pumps

Location	Manufacturer	Qty.	Model #	Serial #	HP	RPM	GPM	Ft. Hd	Frame Size	Volts	Phase	Approx. Age	ASHRAE Service Life	Remaining Life
Boiler Room	Bell & Gosset	2	Series 100	-	1/2 hp	1750	3	6	1"	120	1	10	10	0
Boiler Room	Bell & Gosset	2	Series 100	-	1/2 hp	1750	3	7	1"	120	1	10	10	0
Boiler Room	Bell & Gosset	1	Series 100	-	1/2 hp	1750	4	7	1"	120	1	10	10	0
Boiler Room	Bell & Gosset	1	Series 100	-	1/2 hp	1750	2	6	1"	120	1	10	10	0
Boiler Room	Bell & Gosset	1	Series 100	-	1/2 hp	1750	2	7	1"	120	1	10	10	0
Boiler Room	Bell & Gosset	1	Series PD35T	-	1/2 hp	1750	60	16	-	208	3	10	10	0

Domestic Hot Water Heater

Location	Manufacturer	Qty	Model #	Serial #	Input (MBh)	Recovery (gal/h)	Capacity (gal)	Efficiency (%)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Boiler Room	A.O. Smith	1	PGCG 40 226	MD97-0032978-226	40	43.1	40	80%	Nat. Gas	15	10	-5	

Air Handling Units

Location	Manufacturer	Qty	Model #	Serial #	Cooling Coil	Cooling Eff. (EER)	Cooling Capacity	Heating Type	Input (MBh)	Output (MBh)	Heating Eff. (%)	Fuel	Volts	Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Room 201	Trane	1	TWE-090A	-	R-22	10.1	7.5 Tons	Electric Coil	-	-	-	-	208	3	60	12	15	3	
Room 201	Trane	1	TWE-090A	-	R-22	10.1	7.5 Tons	Electric Coil	-	-	-	-	208	3	60	12	15	3	
Room 210	Trane	1	TWE-060A300BB	L504TAN5H	R-22	-	5 Tons	Electric Coil	-	-	-	-	208	3	60	13	15	3	
Room 210	Trane	1	TWE-030C140A1	M06211YG1V	R-22	-	2.5 Ton	Electric Coil	-	-	-	-	208	3	60	12	15	3	
Room 120	Trane	1	TWE-090A	-	R-22	10.1	7.5 Tons	Electric Coil	-	-	-	-	208	3	60	12	15	3	
Boiler Room	Trane	1	TWE-060A	-	R-22		5 Tons	Electric Coil	-	-	-	-	208	3	60	12	15	3	
Entrance Area &	Sanyo	1	FH1232	-	R-22	10.1	1 Ton	Electric Coil	12	-	-	-	208	1	60	12	15	3	

Heat Pumps

Location	Manufacturer	Qty.	Model #	Serial #	Cooling Capacity	EER Heating Capacity	COP	Refrigerant	Volts	Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Outside	Trane	1	TWA-090A300BC	M264K7GAH	7.5 Ton	11.5	-	R-22	208	3	60	12	19	7	
Outside	Trane	1	TWA-090A300AC	M273SGJAH	7.5 Ton	11.5	-	R-22	208	3	60	12	19	7	
Outside	Trane	1	TWA-048C300A3	M262W5LHF	4 Ton	-	-	R-22	208	3	60	12	19	7	
Outside	Trane	1	TWA-30C300A2	M203M5XCF	2 Ton	-	-	R-22	208	3	60	12	19	7	
Outside	Trane	1	TWA-090A300BC	M273NCDAH	7.5 Ton	11.5	-	R-22	208	3	60	12	19	7	
Outside	Trane	1	TWA-060C300A2	M254WWMFF	5 Ton	-	-	R-22	208	3	60	12	19	7	
Outside	Sanyo	1	CH1232	-	1 Ton	9.9	3.2	R-22	208	1	60	12	19	7	

Unit Heaters and Cabinet Unit Heaters

Location	Manufacturer	Qty.	Model #	Serial #	Heating Type	Heating Capacity (MBH)	CFM	RPM / HP	GPM	Approx. Age	ASHRAE Service Life	Remaining Life	Notes

Exhaust Fans

Location	Manufacturer	Qty.	Model #	Serial #	Heating Coil	Capacity (Btu/h)	Fan HP	Fan RPM	Volts	Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
Above Hall Ceiling	Penn Vent Equivalent	1	SX95WA	-	-	-	1/12 HP	865	115	1	-	15	25	10	
Above Hall Ceiling	Penn Vent Equivalent	1	SX105TR	-	-	-	1/4 HP	1165	115	1	-	15	25	10	

INVESTMENT GRADE LIGHTING AUDIT

CONCORD ENERGY SERVICES

CEG Job #: 9C09058
Project: Lopatcong Township Energy Audit
Address: 232 3rd St, Phillipsburg NJ, 08865
City: Phillipsburg
Building SF: 12,500

"Lopatcong Municipal Building"

DATE: 10/8/2009
KWH COST: $0.160

EXISTING LIGHTING										PROPOSED LIGHTING								SAVINGS			
Line No.		Fixture Location	No. eFixts	Fixture eType	Yearly Usage	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. rFixts	Retro-Unit rDescription	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Payback
1		101 Corridor	9	2x2 2L U-tube T8 Prismatic/ Electronic Ballast	4368	73	0.66	2869.78	$459.16	9	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.66	2869.78	$459.16	0.00
2		102 Building	4	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.33	682.24	$109.16	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.33	682.24	$109.16	0.00
3		103 Building	4	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.33	682.24	$109.16	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.33	682.24	$109.16	0.00
4		104 Mech Equip	4	1x4 2L T8 32W Prismatic/ Electronic Ballast/ Below Ceiling	2080	58	0.23	482.56	$77.21	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.23	482.56	$77.21	0.00
5		105 Elevator Mech	1	1x4 2L T8 32W Prismatic/ Electronic Ballast/ Below Ceiling	2080	58	0.06	120.64	$19.30	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	120.64	$19.30	0.00
6		106 Corridor	5	2x2 2L U-tube T8 Prismatic/ Electronic Ballast	4368	73	0.37	1594.32	$255.09	5	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.37	1594.32	$255.09	0.00
7		107 Detective	3	2x4 3L T8 32W Parabolic/ Electronic Ballast	4368	82	0.25	1074.53	$171.92	3	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.25	1074.53	$171.92	0.00

8		108 Vault	2	2x4 3L T8 32W Parabolic/ Electronic Ballast	4368	82	0.16	716.352	$114.62	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.16	716.352	$114.62	0.00
9		109 Storage	3	2x4 3L T8 32W Parabolic/ Electronic Ballast	720	82	0.25	177.12	$28.34	3	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.25	177.12	$28.34	0.00
10		110 Records	3	2x4 3L T8 32W Parabolic/ Electronic Ballast	720	82	0.25	177.12	$28.34	3	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.25	177.12	$28.34	0.00
11		111 Police chief	3	2x4 3L T8 32W Parabolic/ Electronic Ballast	4368	82	0.25	1074.53	$171.92	3	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.25	1074.53	$171.92	0.00
12		112 Processing	6	2x4 2L T8 32W Parabolic/ Electronic Ballast	4368	58	0.35	1520.06	$243.21	6	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.35	1520.06	$243.21	0.00
13		113 Holding	1	1x4 2L T8 32W Prismatic/ Electronic Ballast/ Below Ceiling	4368	58	0.06	253.344	$40.54	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	253.344	$40.54	0.00
14		114 Toilet	1	1x4 2L T8 32W Prismatic/ Electronic Ballast/ Below Ceiling	4368	58	0.06	253.344	$40.54	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	253.344	$40.54	0.00
15		115 Holding	1	1x4 2L T8 32W Prismatic/ Electronic Ballast/ Below Ceiling	4368	58	0.06	253.344	$40.54	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	253.344	$40.54	0.00
16		116	1	4' 2L T8 32W Wall Mounted Electronic Ballast/ Vanity Light	4368	58	0.06	253.344	$40.54	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	253.344	$40.54	0.00
17		117 Squad Room	6	2x4 3L T8 32W Parabolic/ Electronic Ballast	4368	82	0.49	2149.06	$343.85	6	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.49	2149.06	$343.85	0.00
			2	High Hats - 2 CFL @ 18W/piece	4368	38	0.08	331.968	$53.11	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.08	331.968	$53.11	0.00
18		118 Men's Lockers	5	1x4 2L T8 32W Prismatic/ Electronic Ballast/ Below Ceiling	4368	58	0.29	1266.72	$202.68	5	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.29	1266.72	$202.68	0.00
			2	4' 2L T8 32W Wall Mounted Electronic Ballast/ Vanity Light	4368	58	0.12	506.688	$81.07	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.12	506.688	$81.07	0.00
19		119 Women's	5	1x4 2L T8 32W Prismatic/ Electronic Ballast/ Below Ceiling	4368	58	0.29	1266.72	$202.68	5	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.29	1266.72	$202.68	0.00

19	Lockers	2	4' 2L T8 32W Wall Mounted Electronic Ballast/ Vanity Light	4368	58	0.12	506.688	$81.07	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.12	506.688	$81.07	0.00
20	120 Exercise Room	4	2x4 2L T8 32W Parabolic/ Electronic Ballast	4368	58	0.23	1013.38	$162.14	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.23	1013.38	$162.14	0.00
21	121 Public Assistance & Reception	2	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.16	341.12	$54.58	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.16	341.12	$54.58	0.00
22	122 Multi-Purpose Room	6	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.49	1023.36	$163.74	6	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.49	1023.36	$163.74	0.00
23	123 Fire Prevention	2	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.16	341.12	$54.58	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.16	341.12	$54.58	0.00
24	201 Corridor	4	2x2 2L U-tube T8 Prismatic/ Electronic Ballast	2080	58	0.23	482.56	$77.21	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.23	482.56	$77.21	0.00
25	202 Lounge	7	2x2 2L U-tube T8 Prismatic/ Electronic Ballast	2080	58	0.41	844.48	$135.12	7	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.41	844.48	$135.12	0.00
26	203 Corridor	2	High Hats - 2 CFL @ 18W/piece	2080	38	0.08	158.08	$25.29	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.08	158.08	$25.29	0.00
27	204 Township Clerk	8	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.66	1364.48	$218.32	8	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.66	1364.48	$218.32	0.00
28	205 Storage	2	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.16	341.12	$54.58	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.16	341.12	$54.58	0.00
29	206 Vault	2	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.16	341.12	$54.58	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.16	341.12	$54.58	0.00
30	207 Copy Room	2	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.16	341.12	$54.58	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.16	341.12	$54.58	0.00
31	208 Corridor	5	2x2 2L U-tube T8 Prismatic/ Electronic Ballast	2080	73	0.37	759.2	$121.47	5	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.37	759.2	$121.47	0.00
32	209 Mayor's Office	6	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.49	1023.36	$163.74	6	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.49	1023.36	$163.74	0.00
33	210 Storage	2	2x4 3L T8 32W Parabolic/ Electronic Ballast	720	82	0.16	118.08	$18.89	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.16	118.08	$18.89	0.00
34	211 Vestibule	1	2x2 2L U-tube T8 Prismatic/ Electronic Ballast	2080	73	0.07	151.84	$24.29	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.07	151.84	$24.29	0.00
35	212 Assessor	4	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.33	682.24	$109.16	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.33	682.24	$109.16	0.00

36	213 Treasurer	3	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.25	511.68	$81.87	3	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.25	511.68	$81.87	0.00
37	214 Stairs	1	2x2 2L U-tube T8 Prismatic/ Electronic Ballast	2080	73	0.07	151.84	$24.29	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.07	151.84	$24.29	0.00
		2	4' 2L T8 32W Wall Mounted Electronic Ballast/ Vanity Light	2080	58	0.12	241.28	$38.60	2		0	0.00	0	$0.00	$0.00	$0.00	0.12	241.28	$38.60	0.00
		1	1x4 2L T8 32W Prismatic/ Electronic Ballast/ Below Ceiling	2080	58	0.06	120.64	$19.30	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	120.64	$19.30	0.00
38	215 Lunch Room	4	High Hats - 2 CFL @ 18W/piece	2080	38	0.15	316.16	$50.59	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.15	316.16	$50.59	0.00
39	216 Janitor Closet	1	1x4 2L T8 32W Prismatic/ Electronic Ballast/ Below Ceiling	2080	58	0.06	120.64	$19.30	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	120.64	$19.30	0.00
40	217 Toilet	1	4' 2L T8 32W Wall Mounted Electronic Ballast/ Vanity Light	2080	58	0.06	120.64	$19.30	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	120.64	$19.30	0.00
41	218 Toilet	1	4' 2L T8 32W Wall Mounted Electronic Ballast/ Vanity Light	2080	58	0.06	120.64	$19.30	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	120.64	$19.30	0.00
42	219 Mens	4	4' 2L T8 32W Wall Mounted Electronic Ballast/ Vanity Light	2080	58	0.23	482.56	$77.21	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.23	482.56	$77.21	0.00
43	220 Womens	4	4' 2L T8 32W Wall Mounted Electronic Ballast/ Vanity Light	2080	58	0.23	482.56	$77.21	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.23	482.56	$77.21	0.00
44	221 Vest.	1	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.08	170.56	$27.29	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.08	170.56	$27.29	0.00
45	222 Judge	2	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.16	341.12	$54.58	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.16	341.12	$54.58	0.00
46	223 Toilet	1	4' 2L T8 32W Wall Mounted Electronic Ballast/ Vanity Light	2080	58	0.06	120.64	$19.30	1	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.06	120.64	$19.30	0.00

47		224 Court Room	18	2x4 4L T8 32W Parabolic/ Electronic Ballast	2080	109	1.96	4080.96	$652.95	18	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	1.96	4080.96	$652.95	0.00
48		225 Court Clerk	4	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.33	682.24	$109.16	4	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.33	682.24	$109.16	0.00
49		226&227 Tax Collector Office	2	2x4 3L T8 32W Parabolic/ Electronic Ballast	2080	82	0.16	341.12	$54.58	2	No Change Required	0	0.00	0	$0.00	$0.00	$0.00	0.16	341.12	$54.58	0.00
					2725																
		Totals	182				13.45	35944.6	$5,751.14	182			0.00	0	$0.00		$0.00	13.45	35944.6	$5,751.14	0.00

Project Name: LGEA Solar PV Project - Lopatcong Municipal Building
Location: Phillipsburg, NJ
Description: Photovoltaic System 95% Financing - 20 year

Simple Payback Analysis

	Photovoltaic System 95% Financing - 20 year
Total Construction Cost	$111,780
Annual kWh Production	19,382
Annual Energy Cost Reduction	$3,101
Annual SREC Revenue	$6,784
First Cost Premium	**$111,780**
Simple Payback:	**11.31** Years

Life Cycle Cost Analysis

Analysis Period (years):	25	Financing %:	95%
Financing Term (mths):	240	Maintenance Escalation Rate:	3.0%
Average Energy Cost ($/kWh)	**$0.160**	Energy Cost Escalation Rate:	3.0%
Financing Rate:	7.00%	SREC Value ($/kWh)	$0.350

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Interest Expense	Loan Principal	Net Cash Flow	Cumulative Cash Flow
0	$5,589	0	0	0	$0	0	0	(5,589)	0
1	$0	19,382	$3,101	$0	$6,784	$7,353	$2,526	$5	($5,584)
2	$0	19,285	$3,194	$0	$6,750	$7,171	$2,709	$64	($5,519)
3	$0	19,189	$3,290	$0	$6,716	$6,975	$2,905	$126	($5,393)
4	$0	19,093	$3,389	$0	$6,682	$6,765	$3,115	$192	($5,201)
5	$0	18,997	$3,490	$196	$6,649	$6,540	$3,340	$64	($5,137)
6	$0	18,902	$3,595	$195	$6,616	$6,298	$3,581	$137	($5,001)
7	$0	18,808	$3,703	$194	$6,583	$6,039	$3,840	$212	($4,788)
8	$0	18,714	$3,814	$193	$6,550	$5,762	$4,118	$291	($4,497)
9	$0	18,620	$3,928	$192	$6,517	$5,464	$4,415	$374	($4,123)
10	$0	18,527	$4,046	$191	$6,484	$5,145	$4,735	$460	($3,663)
11	$0	18,434	$4,168	$190	$6,452	$4,803	$5,077	$550	($3,112)
12	$0	18,342	$4,293	$189	$6,420	$4,436	$5,444	$644	($2,468)
13	$0	18,251	$4,421	$188	$6,388	$4,042	$5,837	$742	($1,727)
14	$0	18,159	$4,554	$187	$6,356	$3,620	$6,259	$843	($884)
15	$0	18,068	$4,691	$186	$6,324	$3,168	$6,712	$949	$65
16	$0	17,978	$4,831	$185	$6,292	$2,682	$7,197	$1,059	$1,124
17	$0	17,888	$4,976	$184	$6,261	$2,162	$7,717	$1,173	$2,298
18	$0	17,799	$5,126	$183	$6,230	$1,604	$8,275	$1,292	$3,590
19	$0	17,710	$5,279	$182	$6,198	$1,006	$8,873	$1,416	$5,006
20	$0	17,621	$5,438	$181	$6,167	$365	$9,515	$1,544	$6,550
21	$0	17,533	$5,601	$181	$6,137	$309	$8,747	$2,501	$9,051
22	$0	17,445	$5,769	$180	$6,106	$212	$7,198	$4,286	$13,337
23	$0	17,358	$5,942	$179	$6,075	$0	$0	$11,839	$25,175
24	$0	17,271	$6,120	$178	$6,045	$0	$0	$11,987	$37,163
25	$0	17,185	$6,304	$177	$6,015	$0	$0	$12,142	$49,304
	Totals:	369,768	$83,328	$3,016	$129,419	$91,400	$106,191	$122,136	$95,567
					Net Present Value (NPV)			**$6,745**	
					Internal Rate of Return (IRR)			**11.9%**	

Project Name: LGEA Solar PV Project - Lopatcong Municipal Building
Location: Phillipsburg, NJ
Description: Photovoltaic System - Direct Purchase

Simple Payback Analysis

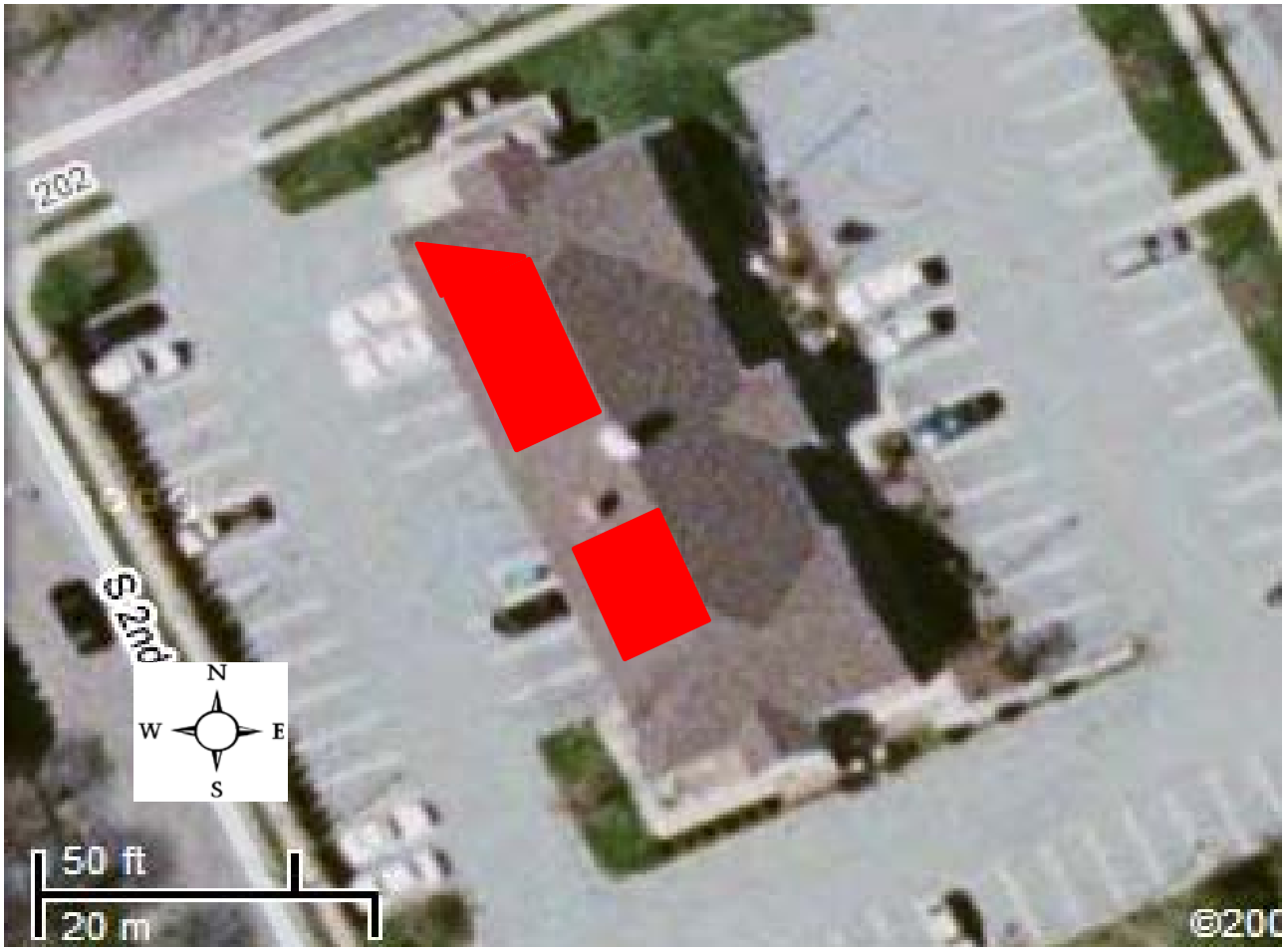
	Photovoltaic System - Direct Purchase
Total Construction Cost	$111,780
Annual kWh Production	19,382
Annual Energy Cost Reduction	$3,101
Annual SREC Revenue	$6,784
First Cost Premium	**$111,780**
Simple Payback:	**11.31** **Years**

Life Cycle Cost Analysis

Analysis Period (years):	25	Financing %:	0%
Financing Term (mths):	0	Maintenance Escalation Rate:	3.0%
Average Energy Cost ($/kWh)	**$0.160**	Energy Cost Escalation Rate:	3.0%
Financing Rate:	0.00%	SREC Value ($/kWh)	$0.350

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Net Cash Flow	Cumulative Cash Flow
0	$111,780	0	0	0	$0	(111,780)	0
1	$0	19,382	$3,101	$0	$6,784	$9,885	($101,895)
2	$0	19,285	$3,194	$0	$6,750	$9,944	($91,951)
3	$0	19,189	$3,290	$0	$6,716	$10,006	($81,945)
4	$0	19,093	$3,389	$0	$6,682	$10,071	($71,874)
5	$0	18,997	$3,490	$196	$6,649	$9,944	($61,930)
6	$0	18,902	$3,595	$195	$6,616	$10,016	($51,914)
7	$0	18,808	$3,703	$194	$6,583	$10,092	($41,822)
8	$0	18,714	$3,814	$193	$6,550	$10,171	($31,651)
9	$0	18,620	$3,928	$192	$6,517	$10,254	($21,398)
10	$0	18,527	$4,046	$191	$6,484	$10,340	($11,058)
11	$0	18,434	$4,168	$190	$6,452	$10,430	($628)
12	$0	18,342	$4,293	$189	$6,420	$10,524	$9,895
13	$0	18,251	$4,421	$188	$6,388	$10,621	$20,517
14	$0	18,159	$4,554	$187	$6,356	$10,723	$31,239
15	$0	18,068	$4,691	$186	$6,324	$10,829	$42,068
16	$0	17,978	$4,831	$185	$6,292	$10,939	$53,007
17	$0	17,888	$4,976	$184	$6,261	$11,053	$64,060
18	$0	17,799	$5,126	$183	$6,230	$11,172	$75,232
19	$0	17,710	$5,279	$182	$6,198	$11,295	$86,527
20	$0	17,621	$5,438	$181	$6,167	$11,424	$97,951
21	$1	17,533	$5,601	$181	$6,137	$11,557	$109,508
22	$2	17,445	$5,769	$180	$6,106	$11,695	$121,203
23	$3	17,358	$5,942	$179	$6,075	$11,839	$133,042
24	$4	17,271	$6,120	$178	$6,045	$11,987	$145,029
25	$5	17,185	$6,304	$177	$6,015	$12,142	$157,171
	Totals:	369,768	$83,328	$3,016	$129,419	$268,951	$209,731
				Net Present Value (NPV)		**$157,196**	
				Internal Rate of Return (IRR)		**7.9%**	

Building	Roof Area (sq ft)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW	Total Annual kWh	Panel Weight (33 lbs)	W/SQFT
Municipal Bldg.	788	Sunpower SPR230	54	14.7	794	12.42	19,382	1,782	15.64



.= Proposed PV Layout

Notes:

1. Estimated kWH based on 4.68 hours full output per day per 365 day year. Actual kWH will vary day to day.