TABERNACLE TOWNSHIP
ANNEX BUILDING
ENERGY ASSESSMENT

for

NEW JERSEY
BUREAU OF PUBLIC UTILITIES

CHA PROJECT NO. 21063

June 2010

Prepared by:

CLOUGH HARBOUR & ASSOCIATES LLP

6 Campus Drive
Parsippany, NJ 07054

(973) 538-2120

TABLE OF CONTENTS

APPENDICES

A	Utility Usage Analysis
B	ECM-1 Furnace Replacement
C	ECM-2 Lighting Replacement
D	New Jersey Incentive Program
E	Photovoltaic (PV) Rooftop Solar Power Generation
F	Solar Thermal Domestic Hot Water Plant
G	Wind
H	EPA Portfolio Manager
I	Equipment Inventory

1.0 INTRODUCTION AND BACKGROUND

The Annex Building was constructed in 1975. The single story, 528 square foot structure, located at 163 Carranza Road in Tabernacle, New Jersey, includes the tax collector's office and planning office.

New Jersey's Clean Energy Program, funded by the New Jersey Board of Public Utilities, supports energy efficiency and sustainability for Municipal and Local Government Energy Audits. Through the support of a utility trust fund, New Jersey is able to assist state and local authorities in reducing energy consumption while increasing comfort.

2.0 EXECUTIVE SUMMARY

This report summarizes the energy audit for the Tabernacle Annex Building, a single story, 528 square foot structure housing the tax collector's office and planning office. The following areas were evaluated for energy conservation measures:

- Lighting replacement
- Furnace replacement

Measures recommended for implementation have a payback of 10 years or less, which is the threshold considered a viable return on investment. The annex has a very small building area and occupancy of only two persons, five days a week. For the measures evaluated, the small size and occupancy contributed to the savings being lower and the paybacks longer than considered an economically feasible return on investment. Therefore, at this time, neither measure is recommended for implementation at the annex building. If the capacity or usage is expanded in the future, it may be conducive to perform another energy audit.

3.0 EXISTING CONDITIONS

3.1 Building - General

The Annex building is a single story, 528 square foot structure constructed in 1975 and houses the tax collector and planning office. The building has a basement which is utilized for sports equipment storage.

The building operates from 8:00 AM to 4:00 PM five days a week and is occupied by two people.

Construction of the building's exterior walls consists of stucco with wood frame, insulation and furred out on the interior with paneling. There are several windows along the building exterior. The windows have vinyl frames and double pane glass. The roof has insulation and shingles.

3.2 Utility Usage

Utilities include electricity and fuel oil. Electricity is purchased from Atlantic City Electric, and fuel oil from Majestic Oil Company. The building has a well outside and does not pay for water.

From January 2009 through December 2009, electric usage was approximately 6,090 kWh at a cost of about $1,100. Analyzing electricity bills during this period, the building was charged at a blended unit cost of $0.18 per kWh. Electricity usage was highest in the summer months when the air conditioning equipment operates. During the same timeframe, the building heat required about 390 gallons of oil. Based on the annual cost of about $800, the average price per gallon was $2.07. Fuel oil deliveries were highest in the winter months to heat the building. Utility data can be found in Appendix A.

Electricity commodity supply and delivery is presently purchased from Atlantic City Electric. The delivery component will always be the responsibility of the utility that connects the facility to the power grid; however, the supply can be purchased from a third party. The electricity commodity supply entity will require submission of one to three years of past energy bills. Contract terms can vary among suppliers. A list of approved electrical energy commodity suppliers can be found in Appendix A.

3.3 HVAC Systems

3.3.1 Space Heating System

The Annex's primary heating system consists of one, Comfort Air Patriot 80 oil fired forced hot air furnace located in the basement. This unit was installed over 10 years' ago and is in acceptable condition.

3.3.2 Air Conditioning Systems

The primary AC system consists of one cooling coil attached to the furnace ductwork. The coil is connected to a two ton condensing unit located outside. The condensing unit is about 10 years' old and serves the offices.

3.3.3 Building Ventilation and Exhaust Systems

Ventilation is provided by the operable windows throughout the building. The single toilet exhaust fan operates with a light switch.

3.4 Control Systems

HVAC is controlled by one thermostat. The occupied setpoints are 68°F for heating and 73°F for cooling; unoccupied are 62°F heating and 80°F cooling. It is scheduled for night setback. The thermostat does not provide weekend scheduling; weekday hours are programmed for weekends.

3.5 Lighting/Electrical Systems

The majority of lighting in the building is F34T-12 fixtures that use 34 watts per lamp. These fixtures are either 4' tubes or 2' u-tubes. The exit lights are incandescent.

Lighting is controlled by individual switches at the main entrance door. The lighting is left on during normal business hours, generally, eight to nine hours daily. Some fixtures use incandescent screw-type bulbs that can be easily upgraded.

The outdoor lighting fixtures are incandescent and mounted directly to the building.

3.6 Plumbing Systems

Domestic hot water is generated by a 30 gallon electric hot water heater with an input of 4.5 kW. This unit, located in the basement, is in good condition.

There is one restroom located on the main floor of the building. All fixtures are standard high flow type.

4.0 ENERGY CONSERVATION MEASURES

4.1 ECM-1 Furnace Replacement

Space heating is provided by a Comfort Air Patriot 80 fuel oil fired furnace, which has a thermal efficiency of about 70%. This ECM evaluated replacing the furnaces with a high efficiency, condensing furnace along with new gas service to the building. The local gas utility, South Jersey Gas, was contacted and noted that new gas service and a meter could be provided to this building at no charge. Modern condensing furnaces operate at much higher efficiencies and change fan speeds due to part load conditions, enabling the furnace to provide heat more accurately to match the changing building load, saving energy.

Review of the fuel oil utility bills determined the existing furnace consumed about 390 gallons of fuel oil annually. With estimated average efficiencies of 95%, the proposed new condensing furnaces will require approximately 390 therms to meet the heat load, resulting in a savings of about $300 per year. The proposed boiler efficiency rating is based on the use of one Rheem high efficiency 95% natural gas furnaces with 75,000 Btuh input. This furnace was used as a direct replacement for the existing furnace.

In addition to the new condensing furnace, other components of this measure include new direct vent flue system, and new gas piping to each unit.

Condensing furnaces have an expected life of 20 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 7,800 gallons fuel oil and (7,800) therms, totaling $6,000.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized below:

ECM-1 Furnace Replacement

Budgetary Cost	Annual Utility Savings					ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Fuel Oil	Gas	Total				
$	kW	kWh	Gallons	Therms	$		$	Years	Years
6,800	0	0	390	(390)	300	(0.1)	300	22.7	21.7

* Incentive shown is per the New Jersey Smart Start program, 2010 Gas Heating Application.

This measure is not recommended.

4.2 ECM-2 Lighting Replacements

A comprehensive fixture survey was conducted of the entire building. Each switch and circuit was identified, and the number of fixtures, locations, and existing wattage established. The majority of the lighting in the facility utilizes T-12 lamps with magnetic ballasts, which are regarded as inefficient by today's standards. In addition, the existing exit signs utilize older, incandescent technology, which can be upgraded to more efficient lighting technology.

Energy savings for this measure were calculated by applying the existing and proposed fixture wattages to the estimated time of operation. The difference resulted in an annual savings of 680 kWh per year.

Supporting calculations, including all assumptions for lighting hours and the annual energy usage for each fixture is provided in Appendix C.

Retrofitting fixtures that utilize T-12 lamps would require replacement with electronic ballasts and T-8 lamps. Incandescent lamps would be replaced with compact fluorescent spiral light bulbs.

Lighting has an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 10,200 kWh, totaling $1,500.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized as follows:

ECM-2 Lighting Replacement

Budgetary Cost	Annual Utility Savings					ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Fuel Oil	Gas	Total				
$	kW	kWh	Gallons	Therms	$		$	Years	Years
1,900	0	680	0	0	100	(0.2)	200	19.0	17.0

* Incentive available through the New Jersey Smart Start Program.

This measure is not recommended.

5.0 PROJECT INCENTIVES

5.1 Incentives Overview

5.1.1 New Jersey Pay For Performance Program

The building will be eligible for incentives from the New Jersey Office of Clean Energy. The most significant incentives will be from the New Jersey Pay for Performance (P4P) Program. The P4P program is designed for qualified energy conservation projects in facilities whose demand in any of the preceding 12 months exceeds 200 kW. Facilities that meet this criterion must also achieve a minimum performance target of 15% energy reduction by using the EPA Portfolio Manager benchmarking tool before and after implementation of the measure(s). If the participant is a municipal electric company customer, and a customer of a regulated gas New Jersey Utility, only gas measures will be eligible under the Program. American Recovery and Reinvestment Act (ARRA) funding, when available, may allow oil, propane and municipal electric customers to be eligible for the P4P Program. Available incentives are as follows:

Incentive #1: Energy Reduction Plan – This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP). The standard incentive pays $0.10 per square foot, up to a maximum of $50,000, not to exceed 50% of facility annual energy cost, paid after approval of application. For building audits funded by the New Jersey Board of Public Utilities, which receive an initial 75% incentive toward performance of the energy audit, facilities are only eligible for an additional $0.05 per square foot, up to a maximum of $25,000, rather than the standard incentive noted above.

Incentive #2: Installation of Recommended Measures – This incentive is based on projected energy saving and designed to pay approximately 60% of the total performance-based incentive. Base incentives deliver $0.11/kWh and $1.10/therm not to exceed 30% of total project cost.

Incentive #3: Post-Construction Benchmarking Report – This incentive is paid after acceptance of a report proving energy savings over one year utilizing the Environmental Protection Agency (EPA) Portfolio Manager benchmarking tool. Incentive #3 base incentives deliver $0.07/kWh and $0.70/therm not to exceed 20% of total project cost.

Combining incentives #2 and #3 will provide a total of $0.18/ kWh and $1.8/therm not to exceed 50% of total project cost. Additional incentives for #2 and #3 are increased by $0.005/kWh and $0.05/therm for each percentage increase above the 15% minimum target to 20%, calculated with the EPA Portfolio Manager benchmarking tool, not to exceed 50% of total project cost.

A new incentive structure is in place for projects exceeding 20% in energy savings, which doubles incentives #2 and #3 for a total of $0.36/kWh and $3.60/therm. For Incentive #1, the maximum incentive has been raised to 80% of project costs, or $2 million per gas account and $2 million per electric account. The 200 kW/month average minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations. This new incentive structure has been extended to December 31, 2010.

5.1.2 New Jersey Smart Start Program

For this program, specific incentives for energy conservation measures are calculated on an individual basis utilizing the 2010 New Jersey Smart Start incentive program. This program provides incentives

dependent upon mechanical and electrical equipment. If applicable, incentives from this program are reflected in the ECM summaries and attached appendices.

If the building qualifies and enters into the New Jersey Pay for Performance Program, all energy savings will be included in the total building energy reduction, and savings will be applied towards the Pay for Performance incentive. A project is not applicable for both New Jersey incentive programs.

5.2 Building Incentives

5.2.1 New Jersey Pay For Performance Program

Under Incentive #1 of the New Jersey Pay for Performance program, the 528 square foot building is eligible for less than $50, and pursuit of this incentive is not recommended. When calculating the total amount under Incentives #2 and #3, all energy conservation measures are applicable since the amount received is based on building-wide energy improvements. The overall energy reduction for the building is not estimated to exceed the 15% minimum; therefore, the building is ineligible for Incentives #2 and #3 as previously discussed. See Appendix D for calculations.

5.2.2 New Jersey Smart Start Program

The Tabernacle Annex Building is eligible for several incentives available under New Jersey Smart Start Programs. The total amount of all qualified incentives is about $500 and includes installing upgrades to the lighting system and a new high efficiency gas fired furnace. See program for more details.

6.0 ALTERNATIVE ENERGY SCREENING EVALUATION

6.1 Geothermal

Geothermal heat pumps (GHP) transfer heat between the constant temperature of the earth and the building to maintain the building's interior space conditions. Below the surface of the earth throughout New Jersey the temperature remains in the low 50°F range throughout the year. This stable temperature provides a source for heat in the winter and a means to reject excess heat in the summer. With GHP systems, water is circulated between the building and the piping buried in the ground. The ground heat exchanger in a GHP system is made up of a closed or open loop pipe system. Most common is the closed loop in which high density polyethylene pipe is buried horizontally at 4-6 feet deep or vertically at 100 to 400 feet deep. These pipes are filled with an environmentally friendly antifreeze/water solution that acts as a heat exchanger. In the summer, the water picks up heat from the building and moves it to the ground. In the winter the system reverses and fluid picks up heat from the ground and moves it to the building. Heat pumps make collection and transfer of this heat to and from the building possible.

The building uses an oil fired furnace to meet the HVAC requirements. Most of the existing equipment is not compatible with a geothermal energy source. Therefore, to take advantage of a GHP system, the existing mechanical equipment would have to be removed or overhauled; and either a low temperature closed loop water source heat pump system or a water to water heat pump system would have to be installed to realize the benefit of the consistent temperature of the ground.

This measure is not recommended due to the extent of HVAC system renovation needed for implementation.

6.2 Solar

6.2.1 Photovoltaic Rooftop Solar Power Generation

The Annex was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter.

The PVWATTS solar power generation model was utilized to calculate PV power generation. The New Jersey Clean Power Estimator provided by the PVWATT solar grid analyzer version 1. The closest city available in the model is Philadelphia, Pennsylvania and a fixed tilt array type was utilized to calculate energy production. The PVWATT solar power generation model is provided in Appendix E.

The State of New Jersey incentives for non-residential PV applications is $1.00/watt up to 50 kW of installed PV array. Federal tax credits are also available for renewable energy projects up to 30% of installation cost. Municipalities do not pay federal taxes; therefore, would not be able to utilize the federal tax credit incentive.

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey solar renewable energy certificates program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to

1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. The cost of the ACP penalty for 2010 is approximately $700; this is the amount that must be paid per SERC by the high emission producers. The expected dollar amount that will be paid to the PV producer for 2010 is expected to be $600/SREC credit. Payments that will be received from the PV producer will change from year to year dependent upon supply and demand. Renewable Energy Consultants is a third party SREC broker that has been approved by the New Jersey Clean Energy Program. As stated above there is no definitive way to calculate an exact price that will be received by the PV producer per SREC over the next 15 years. Renewable Energy Consultants estimated an average of $487/ SERC per year and this number was utilized in the cash flow for this report.

The building had a maximum electricity demand of 9.0 kW and a minimum of 3.5 kW, in 2009. The monthly average over the observed 12 month period was 6.0 kW. The existing load does not justify the use of the maximum incentive cap of 50 kW of installed PV solar array; therefore, a 5.0 kW system was used for the calculations. The system costs for PV installations were derived from the most recent NYSERDA (New York State Energy Research and Development Agency) estimates of total cost of system installation. It should be noted that the cost of installation for a system of this size is currently estimated at $7 per watt or $7,000 per kW of installed system. This has increased in the past few years due to the rise in national demand for PV power generator systems. Other cost considerations will also need to be considered. PV panels have an approximate 20 year life span; however, the inverter device that converts DC electricity to AC has a life span of 10 to 12 years and will need to be replaced multiple times during the useful life of the PV system.

The implementation cost and savings related to this ECM are presented in Appendix E and summarized below:

Photovoltaic (PV) Rooftop Solar Power Generation – 5 kW System

Budgetary Cost	Annual Utility Savings				Total Savings	New Jersey Renewable Energy Incentive*	New Jersey Renewable SREC**	Payback (without incentive)	Payback (with incentives)
	Electricity		Natural Gas	Total					
$	kW	kWh	Therms	$	$	$	$	Years	Years
35,000	0	6,030	0	1,100	1,100	5,000	2,900	>25	7.5

*Incentive based on New Jersey Renewable Energy Program for non-residential applications of $1.00 per Watt of installed capacity
** Estimated Solar Renewable Energy Certificate Program (SREC) for 15 years at $487/1000 kWh

While the measure can be recommended based on the estimated payback period, further investigation of possible installation locations, required system maintenance, and local installation costs are suggested prior to implementation.

6.2.2 Solar Thermal Hot Water Plant

Active solar thermal systems use solar collectors to gather the sun's energy to heat water, another fluid, or air. An absorber in the collector converts the sun's energy into heat. The heat is then transferred by circulating water, antifreeze, or sometimes air to another location for immediate use or storage for later utilization. Applications for active solar thermal energy include providing hot water, heating swimming pools, space heating, and preheating air in residential and commercial buildings.

A standard solar hot water system is typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. Systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. The solar collectors are usually placed on the roof of the building, oriented south, and tilted around the site's latitude, to maximize the amount of radiation collected on a yearly basis.

Currently, an incentive is not available for installation of thermal solar systems. A Federal tax credit of 30% of installation cost for the thermal applications is available; however, the Tabernacle Township does not pay Federal taxes and, therefore, would not benefit from this program.

The implementation cost and savings related to this ECM are presented in Appendix F and summarized as follows:

Solar Thermal Domestic Hot Water Plant

Budgetary Cost	Annual Utility Savings				Total Savings	New Jersey Renewable Energy Incentive	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	$	$	Years	Years
27,100	0	1,880	0	300	300	NA	>25	NA

* No incentive is available in New Jersey at this time.

This measure is not recommended.

6.3 Wind

Small wind turbines use a horizontal axis propeller, or rotor, to capture the kinetic energy of the wind and convert it into rotary motion to drive a generator which usually is designed specifically for the wind turbine. The rotor consists of two or three blades, usually made from wood or fiberglass. These materials give the turbine the needed strength and flexibility, and have the added advantage of not interfering with television signals. The structural backbone of the wind turbine is the mainframe, and includes the slip-rings that connect the wind turbine, which rotates as it points into changing wind directions, and the fixed tower wiring. The tail aligns the rotor into the wind.

To avoid turbulence and capture greater wind energy, turbines are mounted on towers. Turbines should be mounted at least 30 feet above any structure or natural feature within 300 feet of the installation. Smaller turbines can utilize shorter towers. For example, a 250-watt turbine may be mounted on a 30-50 foot tower, while a 10 kW turbine will usually need a tower of 80-120 feet. Tower designs include tubular or latticed, guyed or self-supporting. Wind turbine manufacturers also provide towers.

The New Jersey Clean Energy Program for small wind installations has designated numerous pre-approved wind turbines for installation in the State of New Jersey. Incentives for wind turbine installations are based on kilowatt hours saved in the first year. Systems sized under 16,000 kWh per year of production will receive a $3.20 per kWh incentive. Systems producing over 16,000 kWh will receive $51,200 for the first 16,000 kWh of production with an additional $0.50 per kWh up to a maximum cap of 750,000 kWh per year. Federal tax credits are also available for renewable energy projects up to 30% of installation cost for systems less than 100 kW. However, as noted previously, municipalities do not pay federal taxes and is, therefore, not eligible for the tax credit incentive.

The most important part of any small wind generation project is the mean annual wind speed at the height of which the turbine will be installed. In the Tabernacle, NJ area, the map indicates a mean annual wind speed of under 10 miles per hour. For the Annex building, there are site restrictions. Parking lots, trees and surrounding structures would greatly affect a tower location.

A wind speed map and aerial site photo are included in Appendix G.

This measure is not recommended due to the low mean annual wind speed and site restrictions.

6.4 Combined Heat and Power Generation (CHP)

Combined heat and power, cogeneration, is self-production of electricity on-site with beneficial recovery of the heat byproduct from the electrical generator. Common CHP equipment includes reciprocating engine-driven, micro turbines, steam turbines, and fuel cells. Typical CHP customers include industrial, commercial, institutional, educational institutions, and multifamily residential facilities. CHP systems that are commercially viable at the present time are sized approximately 50 kW and above, with numerous options in blocks grouped around 300 kW, 800 kW, 1,200 kW and larger. Typically, CHP systems are used to produce a portion of the electricity needed by a facility some or all of the time, with the balance of electric needs satisfied by purchase from the grid.

Any proposed CHP project will need to consider many factors, such as existing system load, use of thermal energy produced, system size, natural gas fuel availability, and proposed plant location. The Annex does not have sufficient need for electrical generation and the ability to use most of the thermal byproduct during the winter, thermal usage during the summer months is low. Thermal energy produced by the CHP plant in the warmer months will be wasted. Purchasing this system and performing modifications to the existing HVAC and electrical systems would greatly outweigh the savings over the life of the equipment.

This measure is not recommended.

6.5 Biomass Power Generation

Biomass power generation is a process in which waste organic materials are used to produce electricity or thermal energy. These materials would otherwise be sent to the landfill or expelled to the atmosphere. To participate in NJCEP's Customer On-Site Renewable Energy program, participants must install an on-site sustainable biomass or fuel cell energy generation system. Incentives for bio-power installations are available to support up to 1MW-dc of rated capacity.

*Class I organic residues are eligible for funding through the NJCEP CORE program. Class I wastes include the following renewable supply of organic material:

- Wood wastes not adulterated with chemicals, glues or adhesives
- Agricultural residues (corn stover, rice hulls or nut shells, manures, poultry litter, horse manure, etc) and/or methane gases from landfills
- Food wastes
- Municipal tree trimming and grass clipping wastes
- Paper and cardboard wastes
- Non adulterated construction wood wastes, pallets

The NJDEP evaluates biomass resources not identified in the RPS.

Examples of eligible facilities for a CORE incentive include:

- Digestion of sewage sludge
- Landfill gas facilities
- Combustion of wood wastes to steam turbine
- Gasification of wood wastes to reciprocating engine
- Gasification or pyrolysis of bio-solid wastes to generation equipment

* from NJOCE Website

This measure is not recommended because of noise issues, potential zoning issues, and because the municipal building does not have a steady waste stream to fuel the power generation system. Additionally, purchasing this system and performing modifications to the existing HVAC and electrical systems would greatly outweigh the savings over the life of the equipment.

6.6 Demand Response Curtailment

Utility Curtailment is an agreement with the electric utility company and an approved Curtailment Service Provider (CSP) to shed electrical load by either turning major equipment off or energizing all or part of a facility utilizing an emergency generator; therefore, reducing the electrical demand on the utility grid. This program is to benefit the utility company during high demand periods and incentives are offered to the CSP to participate in this program. Enrolling in the program will require program participants to drop electrical load or turn on emergency generators during high electrical demand conditions or during emergencies. Part of the program also will require that program participants reduce their required load or run emergency generators with notice to test the system.

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. The building had a maximum electricity demand of 9.0 kW and an average of 6.0 kW, in 2009.

This measure is not recommended because the facility does not have an adequate load to meet the minimum load reduction requirement.

7.0 EPA PORTFOLIO MANAGER

The United State Environmental Protection Agency (EPA) is a federal agency in charge of regulating environment waste and policy in the United States. The EPA has released the EPA Portfolio Manager for public use. The program is designed to allow property owners and managers to share, compare and improve upon their facility's energy consumption. Inputting such parameters as electricity, heating fuel, building characteristics and location into the website based program generates a naturalized energy rating score out of 100. Once an account is registered, monthly utility data can be entered to track the savings progress and retrieve an updated energy rating score on a monthly basis.

The Annex Building had a Site Energy Usage Index (EUI) of 131 kBTU/ft^2/year and after implementing the ECMs, the new EUI would be 111 kBTU/ft^2/year. The EPA Portfolio Manager did not generate an energy rating score for this building because the building must have a minimum size of 5,000 sq. ft.

A full EPA Energy Star Portfolio Manager Report is located in Appendix H.

The user name and password for the municipal building's EPA Portfolio Manager Account has been provided to Douglas Cramer of the Township of Tabernacle.

8.0 CONCLUSIONS & RECOMMENDATIONS

The energy audit conducted by CHA at the Tabernacle Annex Building in Tabernacle, New Jersey did not identify any measures recommended for implementation. If the size of the building or occupancy is increased in the future, performing another energy audit may be feasible.

APPENDIX A

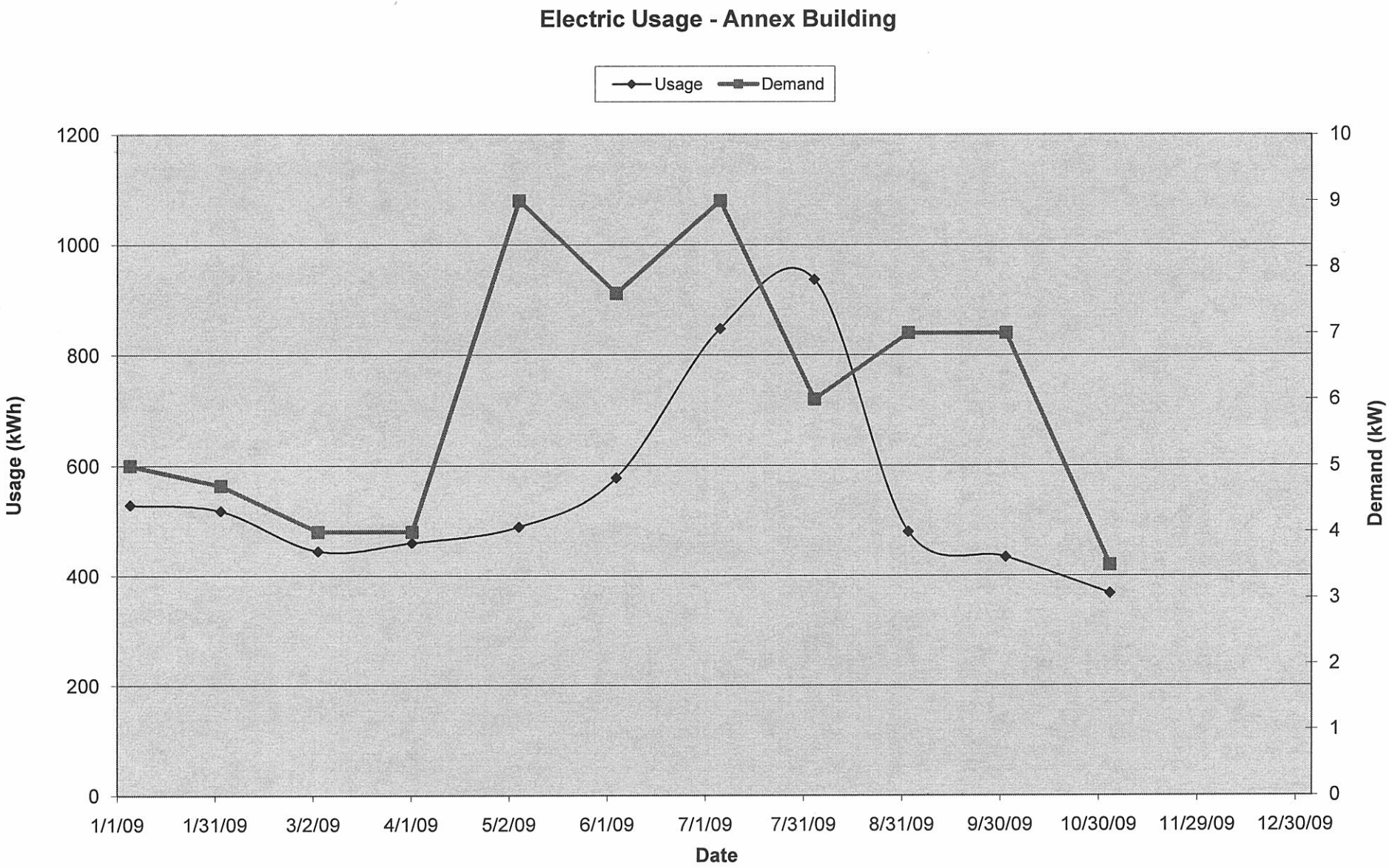
Utility Usage Analysis

New Jersey BPU Energy Audit Program
CHA #21063
Tabernacle
Annex

Account Number: 0039-6799-9990
Atlantic City Electric

Meter #:

			Charges			Unit Costs		
Date	Consumption (kWh)	Demand (kW)	Total ($)	Demand ($)	Consumption ($)	Blended Rate ($/kWh)	Consumption ($/kWh)	Demand ($/kW)
1/5/09	454	5	$ 77	$0.00	$77.00	0.1696	0.1696	-
2/2/09	529	5	$ 87	$0.00	$87.00	0.1645	0.1645	-
3/4/09	518	4.7	$ 86	$0.00	$86.00	0.1660	0.1660	-
4/2/09	445	4	$ 75	$0.00	$75.00	0.1685	0.1685	-
5/5/09	460	4	$ 78	$0.00	$78.00	0.1696	0.1696	-
6/4/09	489	9	$ 84	$0.00	$84.00	0.1718	0.1718	-
7/6/09	578	7.6	$ 118	$0.00	$118.00	0.2042	0.2042	-
8/4/09	848	9	$ 170	$0.00	$170.00	0.2005	0.2005	-
9/2/09	937	6	$ 187	$0.00	$187.00	0.1996	0.1996	-
10/2/09	480	7	$ 97	$0.00	$97.00	0.2021	0.2021	-
11/3/09	434	7	$ 78	$0.00	$78.00	0.1797	0.1797	-
12/3/09	368	3.5	$ 67	$0.00	$67.00	0.1821	0.1821	-
Total	6,086	9.0	$1,127.00	$0.00	$1,127.00	0.1852	0.1852	-
Most Recent Yr	6,086	9.0	$1,127.00	$0.00	$1,127.00	0.1852	0.1852	-

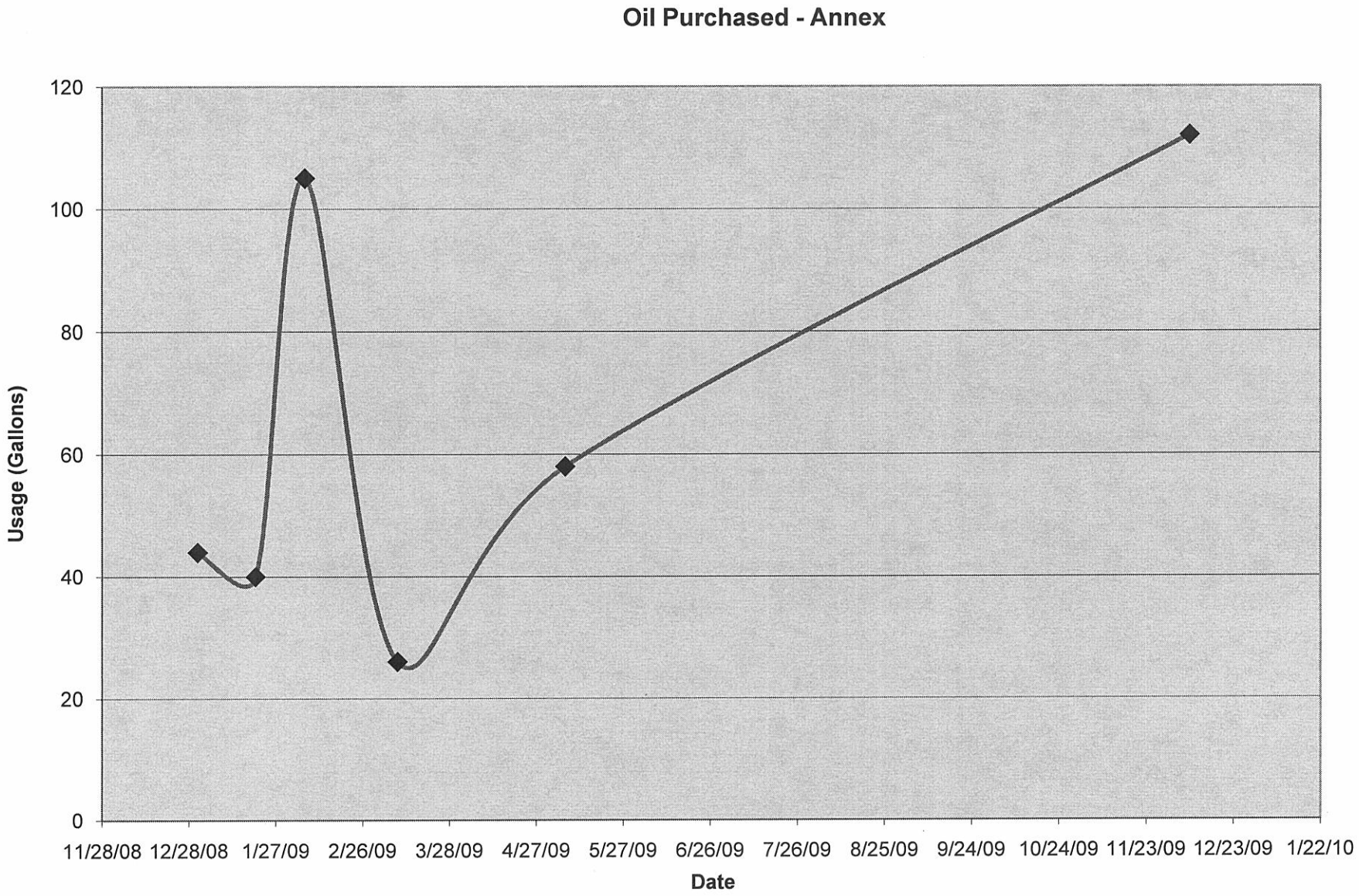

Electric Usage - Annex Building
Usage
Demand
Usage (kWh)
Demand (kW)
1200
1000
800
600
400
200
0
10
9
8
7
6
5
4
3
2
1
0
1/1/09
1/31/09
3/2/09
4/1/09
5/2/09
6/1/09
7/1/09
7/31/09
8/31/09
9/30/09
10/30/09
11/29/09
12/30/09
Date

New Jersey BPU Energy Audit Program
CHA #21063
Tabernacle
Annex

Account Number: 2352
Majestic Oil Company

Date	Gallons	Cost	($/Gallon)
12/31/08	44	78	1.77
1/20/09	40	81	2.03
2/6/09	105	210	2.00
3/10/09	26	45	1.73
5/7/09	58	104	1.79
12/8/09	112	279	2.49

Total	385	$797.00	2.070
Most Recent Yr	385	$797.00	2.070


Oil Purchased - Annex
120
100
80
60
40
20
0
Usage (Gallons)
11/28/08
12/28/08
1/27/09
2/26/09
3/28/09
4/27/09
5/27/09
6/26/09
7/26/09
8/25/09
9/24/09
10/24/09
11/23/09
12/23/09
1/22/10
Date

ELECTRIC MARKETERS LIST

The following is a listing of marketers/suppliers/brokers that have been licensed by the NJ Board of Public Utilities to sell electricity to residential, small commercial and industrial customers served by the Public Service Electric and Gas Company distribution system. **This listing is provided for informational purposes only and PSE&G makes no representations or warranties as to the competencies of the entities listed herein or to the completeness of this listing.**

American Powernet Management
867 Berkshire Blvd, Suite 101
Wyomissing, PA 19610
www.americanpowernet.com

BOC Energy Services
575 Mountain Avenue
Murray Hill, NJ 07974
www.boc-gases.com

Commerce Energy Inc.
535 Route 38, Suite 138
Cherry Hill, NJ 08002
(888) 817-8572 or
(858) 910-8099
www.commerceenergy.com

ConEdison Solutions
701 Westchester Avenue
Suite 201 West
White Plains, NY 10604
(800) 316-8011
www.ConEdSolutions.com

Constellation NewEnergy, Inc.
1199 Route 22 East
Mountainside, NJ 07092
908 228-5100
www.newenergy.com

Credit Suisse (USA), Inc.
700 College Road East
Princeton, NJ 08450
www.creditsuisse.com

Direct Energy Services, LLC
One Gateway Center, Suite 2600
Newark, NJ 07102
(973) 799-8568
www.directenergy.com

FirstEnergy Solutions
395 Ghent Road Suite 407
Akron, OH 44333
(800) 977-0500
www.fes.com

Gerdau Ameristeel Energy Co.
North Crossman Road
Sayreville, NJ 08872

Gexa Energy LLC New Jersey
20 Greenway Plaza, Suite 600
Houston, TX 77046
(866) 304-GEXA
Beth.miller@gexaenergy.com

Glacial Energy of New Jersey
2602 McKinney Avenue, Suite 220
Dallas, TX 75204
www.glacialenergy.com

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095
www.hess.com

Integrys Energy Services, Inc
99 Wood Avenue, Suite 802
Iselin, NJ 08830
www.integrysenergy.com

Liberty Power Delaware, LLC
1901 W Cypress Road, Suite 600
Fort Lauderdale, FL 33309
(866) Power-99
(866) 769-3799
www.libertypowercorp.com

Liberty Power Holdings, LLC
1901 W Cypress Creek Road, Suite 600
Fort Lauderdale, FL 33309
(866) Power-99
(866) 769-3799
www.libertypowercorp.com

Pepco Energy Services, Inc.
d/b/a Power Choice
23 S. Kinderkamack Rd Ste D
Montvale, NJ 07645
(800) 363-7499
www.pepco-services.com

PPL EnergyPlus, LLC
Energy Marketing Center
Two North Ninth Street
Allentown, PA 18101
1-866-505-8825
http://www.pplenergyplus.com/

Sempra Energy Solutions
The Mac-Cali Building
581 Main Street, 8th Floor
Woodbridge, NJ 07095
(877) 273-6772
www.SempraSolutions.com

South Jersey Energy Company
1 South Jersey Plaza, Route 54
Folsom, NJ 08037
(800) 756-3749
www.sjindustries.com

Strategic Energy, LLC
6 East Main Street, Suite 6E
Ramsey, NJ 07446
(888) 925-9115
www.sel.com

Suez Energy Resources NA
333 Thornall Street FL6
Edison, NJ 08818
866.999.8374(toll free)
www.suezenergyresources.com

UGI Energy Services, Inc.
d/b/a POWERMARK
1 Meridian Blvd. Suite 2C0l
Wyomissing, PA 19610
(800) 427-8545
www.ugienergyservices.com

Jan 14, 2009

APPENDIX B

ECM-1 Furnace Replacement

Tabernacle Township
CHA #21063
Building: ANNEX Building

ECM-1 Furnace Replacement

Existing Fuel	#2 Oil
Proposed Fuel	Nat.Gas

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 2.07		
Proposed Fuel Cost	$ 1.20		
Baseline Fuel Use	385	Gals #2	Based on historical utility data
Existing Furnace Efficiency	70%		Estimated or Measured
Baseline Load	37,380	Mbtu/yr	Baseline Fuel Use x Existing Efficiency x 138.7 Mbtu/Gals #2
Baseline Fuel Cost	$ 797		
Proposed Efficiency	95%		New Furnace Efficiency
Proposed Fuel Use	393	Therms	Baseline Boiler Load / Proposed Efficiency / 100 Mbtu/Therms
Proposed Fuel Cost	$ 472		
Annual Savings	385	Gals #2	
	(393)	Therms	
Annual Savings	**$ 325**	**/yr**	

*Note to engineer: Link savings back to summary sheet in appropriate column.

Tabernacle Township
CHA #21063
Building: ANNEX Building

ECM-1 Furnace Replacement

Multipliers	
Material:	0.98
Labor:	1.21
Equipment:	1.09

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Install new Furnace and gas piping	1	ls				$ -	$ -	$ -	$ 6,000	contractor quote
from meter to unit. All low voltage						$ -	$ -	$ -	$ -	
and line voltage wiring is included.						$ -	$ -	$ -	$ -	
Gas utility will provide new gas						$ -	$ -	$ -	$ -	
service and meter to building from street						$ -	$ -	$ -	$ -	
Rheem model #RGRC07EMAES						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

$ 6,000	Subtotal
$ 750.00	Contingency
$ -	Contractor O&P
	Engineering
$ 6,750	**Total**

APPENDIX C

ECM-2 Lighting Replacement

Tabernacle Township
CHA #21063
Building: ANNEX Building

ECM-2 Replacement of incandescent and T-12 lights

Building Schedule:

Existing conditions (master switch):	40	hrs/week
Supply Electric Rate	$ 0.196	/kWh
Demand Rate	$ -	/kW

	EXISTING CONDITIONS										RETROFIT CONDITIONS								COST ANALYSIS				
Area Description	Number of Fixtures	Fixture Code	Watts per Fixture	Number of Non-Operational Fixtures	Watts per Non-Operational Fixtures	kW/Space	Exist Control	Daily Hours	Annual Hours	Annual kWh	Number of Fixtures	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Daily Hours	Annual Hours	Annual kWh	kW Saved	Annual kWh Saved	Annual $ Saved	Retrofit Cost	Simple Payback
Main area	12	F42ES	80	0	80	0.96	switch	8	2,080	1,997	12	F42LL	60	0.72	switch	8	2,080	1,498	0	499	$ 98	$ 1,506	15.4
Outdoor light	1	I150	150	0	150	0.15	timer	8	2,080	312	1	CF42	84	0.084	timer	8	2,080	175	0	137	$ 27	$ 125	4.7
Outdoor light	1	I140	40	0	40	0.04	switch	8	2,080	83	1	CF23	23	0.023	switch	8	2,080	48	0	35	$ 7	$ 125	18.1
Basement	6	I60	60	1	60	0.42	switch	0.1	20	8	1	FCF23	23	0.023	switch	0.1	20	0	0	8	$ 2	$ 125	80.5
TOTALS -	20			1		1.6				2,400	15			0.9				1,721	0.7	680	$ 133	$ 1,882	14.1

APPENDIX D

New Jersey Incentive Program

Tabernacle Township
CHA #21063
Building: ANNEX Building

New Jersey Pay For Performance Incentive Program

Note: The following calculation is based on the New Jersey Pay For Performance Incentive Program per January, 2010. Building must have a minimum average electric demand of 200 kW. This minimum is waived for buildings owned by local governements or non-profit organizations.
The incentive values represented below are applicable through December 31, 2010.

Total Building Area (Square Feet)	528
Is this audit funded by the NJ BPU (Y/N)	Yes

Bureau of Public Utilites (BPU)

Incentive #1		
Audit not funded by NJ BPU	$0.10	$/sqft
Audit is funded by NJ BPU	$0.05	$/sqft

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	$1,100	$0
Existing Usage (from utility)	6,090	0
Proposed Savings	680	(390)
Existing Total MMBtus	21	
Proposed Savings MMBtus	-37	
% Energy Reduction	**-176.5%**	
Proposed Annual Savings	$400	

Negative impact on NG consumption is due to the conversion from Fuel Oil.
Fuel Oil savings is not reflected here.

	≥ %15 - < 20%	
	$/kWh	$/therm
Incentive #2	$0.11	$1.10
Incentive #3	$0.07	$0.70

	≥ 20%	
	$/kWh	$/therm
Incentive #2	$0.22	$2.20
Incentive #3	$0.14	$1.40

	Incentives $		
	Elec	Gas	Total
Incentive #1* **	$0	$0	$26
Incentive #2	$0	$0	$0
Incentive #3	$0	$0	$0
Total All Incentives	**$0**	**$0**	**$26**

Total Project Cost	$8,700
% Incentives #1 of Utility Cost*	2.4%
% Incentives #2 & #3 of Project Cost**	0.0%
Total Eligible Incentives* **	$26
Project Cost w/ Incentives	$8,674

Project Payback (years)	
w/o Incentives	w/ Incentives
21.8	21.7

* Maximum allowable incentive is 50% of annual utility cost if not funded by NJ BPU, and %25 if it is.

** Maximum allowable amount of Incentive #2 & #3 is 80% of total project cost.

*** Maximum allowable amount of Incentive #1 is $50,000 if not funded by NJ BPU, and $25,000 if it is.
Maximum allowable amount of Incentive #2 & #3 is $2 million per gas account and $2 million per electric account

APPENDIX E

Photovoltaic (PV) Rooftop Solar Power Generation

Tabernacle Township
ANNEX Building

Cost of Electricity $0.180 $/kWh

Photovoltaic (PV) Rooftop Solar Power Generation-5kW System

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	New Jersey Renewable * Energy Incentive	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
$35,000	**0.0**	**6,030**	**0**	**$1,085**	**0**	**$1,085**	**$5,000**	**$2,900**	**32.2**	**7.5**

Note: Budgetary cost is based on $7,000/kW.

*Incentive based on New Jersey renewable energy program for non-residential applications(PV)= $1.00/W of installed PV system

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= $487/1000kwh

Estimated Solar Renewable Energy Certificate Program (SREC) payments for 15 Years from RR Renewable Energy Consultants

Year	SREC
1	600
2	600
3	600
4	500
5	500
6	500
7	500
8	500
9	500
10	500
11	400
12	400
13	400
14	400
15	400
AVG	**487**

PVWatts *** AC Energy & Cost Savings

Cautions for Interpreting the Results

Station Identification	
City:	Philadelphia
State:	Pennsylvania
Latitude:	39.88° N
Longitude:	75.25° W
Elevation:	9 m
PV System Specifications	
DC Rating:	5.0 kW
DC to AC Derate Factor:	0.770
AC Rating:	3.8 kW
Array Type:	Fixed Tilt
Array Tilt:	39.9°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	18.0 ¢/kWh

Results			
Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	3.30	405	72.90
2	4.16	461	82.98
3	4.74	555	99.90
4	5.06	557	100.26
5	5.20	570	102.60
6	5.43	558	100.44
7	5.51	578	104.04
8	5.67	599	107.82
9	5.07	531	95.58
10	4.59	519	93.42
11	3.37	381	68.58
12	2.67	317	57.06
Year	4.57	6030	1085.40

Output Hourly Performance Data

About the Hourly Performance Data

*

Output Results as Text

Saving Text from a Browser

Run PVWATTS v.1 for another US location or an International location
Run PVWATTS v.2 (US only)

Please send questions and comments regarding PVWATTS to Webmaster

Disclaimer and copyright notice

Cautions for Interpreting the Results

The monthly and yearly energy production are modeled using the PV system parameters you selected and weather data that are typical or representative of long-term averages. For reference, or comparison with local information, the solar radiation values modeled for the PV array are included in the performance results.

Because weather patterns vary from year-to-year, the values in the tables are better indicators of long-term performance than performance for a particular month or year. PV performance is largely proportional to the amount of solar radiation received, which may vary from the long-term average by ± 30% for monthly values and ± 10% for yearly values. How the solar radiation might vary for your location may be evaluated by examining the tables in the *Solar Radiation Data Manual for Flat-Plate and Concentrating Collectors* (*http://rredc.nrel.gov/solar/old_data/nsrdb/redbook/*).

For these variations and the uncertainties associated with the weather data and the model used to model the PV performance, future months and years may be encountered where the actual PV performance is less than or greater than the values shown in the table. The variations may be as much as 40% for individual months and up to 20% for individual years. Compared to long-term performance over many years, the values in the table are accurate to within 10% to 12%.

If the default overall DC to AC derate factor is used, the energy values in the table will overestimate the actual energy production if nearby buildings, objects, or other PV modules and array structure shade the PV modules; if tracking mechanisms for one- and two-axis tracking systems do not keep the PV arrays at the optimum orientation with respect to the sun's position; if soiling or snow cover related losses exceed 5%; or if the system performance has degraded from new. (PV performance typically degrades 1% per year.) If any of these situations exist, an overall DC to AC derate factor should be used with PVWATTS that was calculated using system specific component derate factors for *shading*, *sun-tracking*, *soiling*, and *age*.

The PV system size is the nameplate DC power rating. The energy production values in the table are valid only for crystalline silicon PV systems.

The cost savings are determined as the product of the number of kilowatt hours (kWh) and the cost of electricity per kWh. These cost savings occur if the owner uses all the electricity produced by the PV system, or if the owner has a net-metering agreement with the utility. With net-metering, the utility bills the owner for the net electricity consumed. When electricity flows from the utility to the owner, the meter spins forward. When electricity flows from the PV system to the utility, the meter spins backwards.

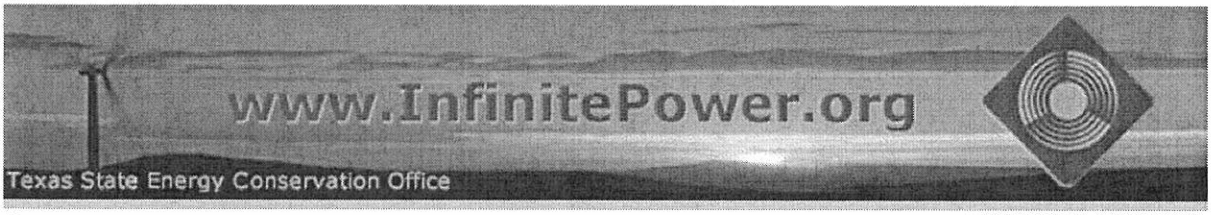
If net-metering isn't available and the PV system sends surplus electricity to the utility grid, the utility generally buys the electricity from the owner at a lower price than the owner pays the utility for electricity. In this case, the cost savings shown in the table should be reduced.

Besides the cost savings shown in the table, other benefits of PV systems include greater energy independence and a reduction in fossil fuel usage and air pollution. For commercial customers, additional cost savings may come from reducing demand charges. Homeowners can often include the cost of the PV system in their home mortgage as a way of accommodating the PV system's initial cost.

To accelerate the use of PV systems, many state and local governments offer financial incentives and programs. Go to http://www.nrel.gov/stateandlocal for more information.

APPENDIX F

Solar Thermal Domestic Hot Water Plant



Interactive Energy Calculators

RENEWABLE ENERGY
THE INFINITE POWER OF TEXAS

Our calculators help you understand energy production and consumption in a whole new way. Use them to develop a personal profile of your own energy use.

Carbon Pollution Calculator
Electric Power Pollution Calculator
PV System Economics
Solar Water Heating
What's a Watt?

Solar Water Heating Calculator

Water heating is a major energy consumer. Although the energy consumed daily is often less than for air conditioning or heating, it is required year round, making it a good application of solar energy. Use this calculator to explore the energy usage of your water heater, and to estimate whether a solar water heater could save you money.

Water Heater Characteristics			
Physical		**Thermal**	
? Diameter (feet)	1	? Water Inlet Temperature (Degrees F)	50
? Capacity (gallons)	30	? Ambient Temperature (Degrees F)	70
? Surface Area (calculated - sq ft)	17.61	? Hot Water Temperature (Degrees F)	120
? Effective R-value	NaN	? Hot Water Usage (Gallons per Day)	30
Energy Use			
718.4		? Heat Delivered in Hot Water (BTU/hr)	
0		? Heat loss through insulation (BTU/hr)	

Gas vs. Electric Water Heating		
Gas		**Electric**
0	? Overall Efficiency	0.98
0	? Conversion Efficiency	0.98
NaN BTU/hr	? Power Into Water Heater	733.1 BTU/hr
Cost		
$ 0 /Therm	? Utility Rates	$ 0.18 /kWh
$ NaN	? Yearly Water Heating Cost	$ 338.549
How Does Solar Compare?		
? Solar Water Heater Cost: $ 27100		? Percentage Solar: 70
NaN years for gas	? Payback Time for Solar System	114.353 years for electric

NJBPU Energy Audits
CHA #21063
ANNEX Building
Tabernacle Township

Multipliers	
Material:	0.98
Labor:	1.21
Equipment:	1.09

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Synergy Solar Thermal System	2	ea			$ 3,600	$ -	$ -	$ 7,848	$ 7,848	
Piping modifications	1	ls	$ 2,000	$ 3,500		$ 1,960	$ 4,235	$ -	$ 6,195	
Electrical modifications	1	ls	$ 1,000	$ 1,000		$ 980	$ 1,210	$ -	$ 2,190	
65 GallonStorage Tanks	2	ea	$ 200	$ 250		$ 400	$ 500	$ -	$ 900	
10 Gallon Drip Tank	2	ea	$ 100	$ 78		$ 200	$ 156	$ -	$ 356	
						$ -	$ -	$ -	$ -	

$17,489	Subtotal
$ 2,623	15% Contingency
$ 2,623	15% Contractor O&P
$ 4,372	25% Engineering
$27,108	**Total**

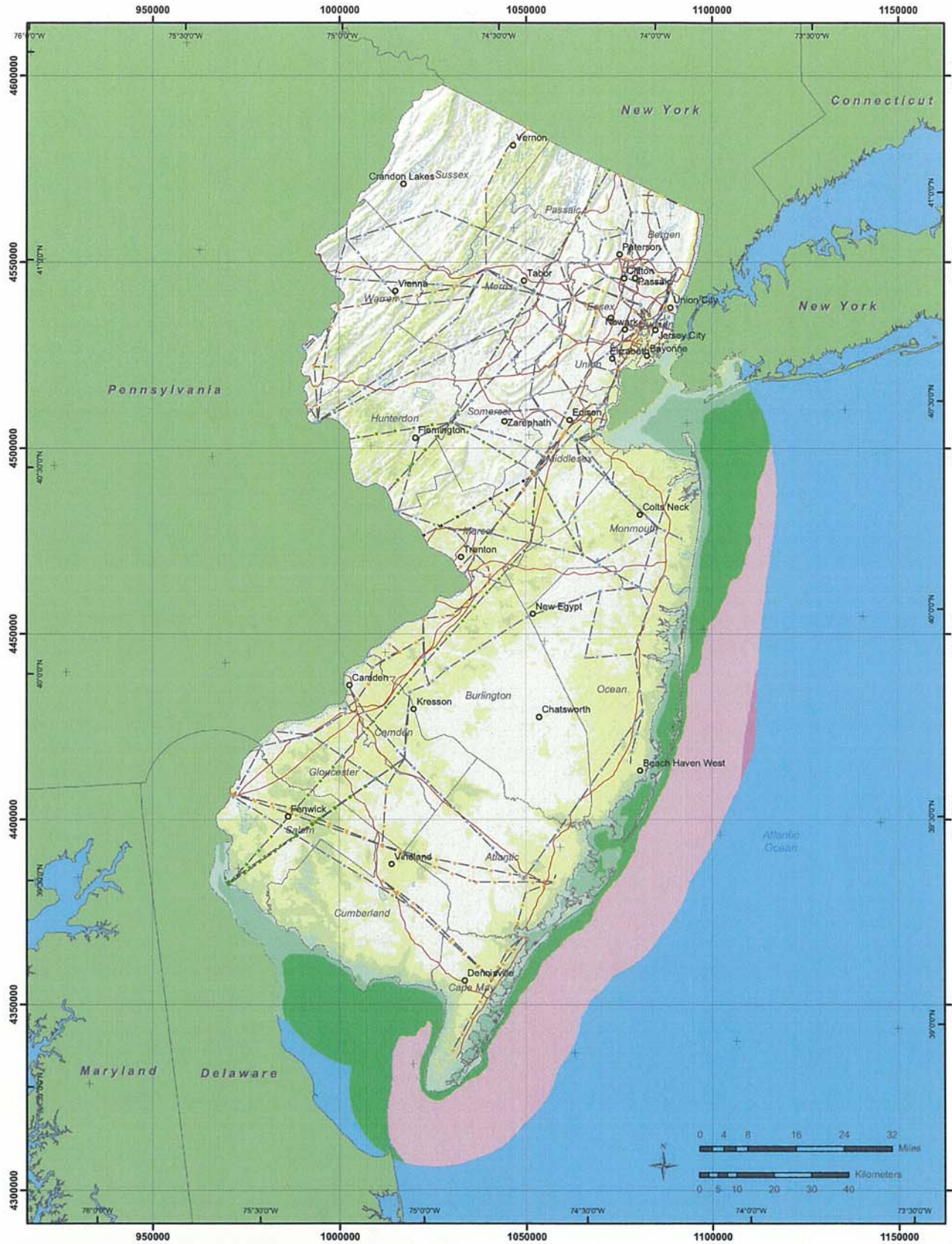
APPENDIX G

Wind

Bing Maps

163 Carranza Rd, Tabernacle, NJ 08088-9304

My Notes



Wind Resource of New Jersey

Mean Annual Wind Speed at 30 Meters

Features

- City
- Interstate Highway
- County Boundary
- Water Body

Generalized Transmission Line

Category	
Under 100 kV	500 kV
100 kV-161 kV	735 kV +
230 kV-287 kV	Step-Up
345 kV	DC Line

Mean Speed at 30 m		
mph	m/s	
< 10.1	< 4.5	13.4 - 14.5 / 6.0 - 6.5
10.1 - 11.2	4.5 - 5.0	14.5 - 15.7 / 6.5 - 7.0
11.2 - 12.3	5.0 - 5.5	15.7 - 16.8 / 7.0 - 7.5
12.3 - 13.4	5.5 - 6.0	16.8 - 17.9 / 7.5 - 8.0
		17.9 - 19.0 / 8.0 - 8.5
		> 19.0 / > 8.5

AWS Truewind

Projection: Tranverse Mercator,
UTM Zone 17 WGS84
Spatial Resolution of Wind Resource Data: 200m
This map was created by AWS Truewind using the MesoMap system and historical weather data. Although it is believed to represent an accurate overall picture of the wind energy resource, estimates at any location should be confirmed by measurement.
The transmission line information was obtained by AWS Truewind from the Global Energy Decisions Velocity Suite. AWS does not warrant the accuracy of the transmission line information.

APPENDIX H

EPA Portfolio Manager

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Annex

Building ID: 2209634
For 12-month Period Ending: December 31, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: April 07, 2010

Facility	**Facility Owner**	**Primary Contact for this Facility**
Annex	Tabernacle Township	Douglas Cramer
163 Carranza Road	163 Carranza Road	163 Caranza oad
Tabernacle, NJ 08088	Tabernacle, NJ 08088	Tabrnacle, NJ 08088

Year Built: 1970
Gross Floor Area (ft²): 540

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

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	22,360
Fuel Oil (No. 2) (kBtu)	53,987
Natural Gas - (kBtu)[4]	0
Total Energy (kBtu)	76,347

Energy Intensity[5]	
Site (kBtu/ft²/yr)	141
Source (kBtu/ft²/yr)	239

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	7

Electric Distribution Utility
Pepco - Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	77
National Average Source EUI	182
% Difference from National Average Source EUI	32%
Building Type	Office

Stamp of Certifying Professional

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

Certifying Professional
N/A

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

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

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	Annex	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Office	Is this an accurate description of the space in question?		☐
Location	163 Carranza Road, Tabernacle, NJ 08088	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		☐
Main office (Office)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	540 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 Office space 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	3	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. The normal worker density ranges between 0.3 and 10 workers per 1000 square feet (92.8 square meters)		☐
Number of PCs	3	Is this the number of personal computers in the Office?		☐
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: Pepco - Atlantic City Electric Co

Fuel Type: Electricity

Meter: Electrical (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
11/05/2009	12/04/2009	368.00
10/05/2009	11/04/2009	434.00
09/05/2009	10/04/2009	480.00
08/05/2009	09/04/2009	937.00
07/05/2009	08/04/2009	848.00
06/05/2009	07/04/2009	578.00
05/05/2009	06/04/2009	489.00
04/05/2009	05/04/2009	460.00
03/05/2009	04/04/2009	445.00
02/05/2009	03/04/2009	518.00
01/05/2009	02/04/2009	529.00
Electrical Consumption (kWh (thousand Watt-hours))		**6,086.00**
Electrical Consumption (kBtu (thousand Btu))		**20,765.43**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**20,765.43**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Fuel Oil (No. 2)

Meter: main Oil (Gallons)
Space(s): Entire Facility

Start Date	End Date	Energy Use (Gallons)
11/05/2009	12/04/2009	0.00
10/05/2009	11/04/2009	0.00
09/05/2009	10/04/2009	0.00
08/05/2009	09/04/2009	0.00
07/05/2009	08/04/2009	0.00
06/05/2009	07/04/2009	112.00
05/05/2009	06/04/2009	58.00
04/05/2009	05/04/2009	26.00
03/05/2009	04/04/2009	105.00
02/05/2009	03/04/2009	40.00
01/05/2009	02/04/2009	44.00

main Oil Consumption (Gallons)	**385.00**
main Oil Consumption (kBtu (thousand Btu))	**53,395.84**
Total Fuel Oil (No. 2) Consumption (kBtu (thousand Btu))	**53,395.84**
Is this the total Fuel Oil (No. 2) consumption at this building including all Fuel Oil (No. 2) 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.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same as the 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
Annex
163 Carranza Road
Tabernacle, NJ 08088

Facility Owner
Tabernacle Township
163 Carranza Road
Tabernacle, NJ 08088

Primary Contact for this Facility
Douglas Cramer
163 Caranza oad
Tabrnacle, NJ 08088

General Information

Annex	
Gross Floor Area Excluding Parking: (ft²)	540
Year Built	1970
For 12-month Evaluation Period Ending Date:	December 31, 2009

Facility Space Use Summary

Main office	
Space Type	Office
Gross Floor Area(ft2)	540
Weekly operating hours	40
Workers on Main Shift	3
Number of PCs	3
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 12/31/2009)	**Baseline** (Ending Date 12/31/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft2)	141	141	53	N/A	77
Source (kBtu/ft2)	239	239	90	N/A	182
Energy Cost					
$/year	N/A	N/A	N/A	N/A	N/A
$/ft²/year	N/A	N/A	N/A	N/A	N/A
Greenhouse Gas Emissions					
$MtCO_2e$/year	7	7	3	N/A	4
$kgCO_2e/ft^2$/year	14	14	5	N/A	8

More than 50% of your building is defined as Office. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Office. This building uses X% less energy per square foot than the CBECS national average for Office.

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

APPENDIX I

Equipment Inventory

New Jersey BPU Energy Audit Program

Borough of Tabernacle, NJ

CHA#21063

ANNEX Municipal Building										
Item	Qty.	Manuf	Model No.	Serial No.	Capacity	Condition	Gas	MBH	Refrig.	Comments
Furnace										
1	1	Ducane	TB7404079816			G		85		
Condensing Unit										
2	1					P				
Domestic Hot Water Heater										
3	1	Bradford White			30 Gallon	E				4.5 KW
Exhaust Fans										
4	1	Broan				G				Bathroom
5	1	Broan				P				Wall mounted

E = Excellent
G = Good
P = Poor