BOROUGH OF TENAFLY
DEPARTMENT OF PUBLIC WORKS
PARKS GARAGE
ENERGY ASSESSMENT

for

NEW JERSEY
BOARD OF PUBLIC UTILITIES

CHA PROJECT NO. 21794

DECEMBER 2010

Prepared by:

6 Campus Drive
Parsippany, NJ 07054

(973) 538-2120

TABLE OF CONTENTS

APPENDICES

A Utility Usage Analysis
B ECM-1 Replace Electric Domestic Hot Water Heater
C ECM-2 Lighting Replacements
D New Jersey Pay For Performance 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 Borough of Tenafly Department of Public Works (DPW) Parks garage is a 6,000 square foot, two story structure, located at the DPW complex at 107 Grove Street. The building was constructed in 2005 and consists of a breakroom, restroom, repair shop, storage loft, and large vehicle area. The Tenafly DPW complex operates from 7:00 AM to 3:00 PM, Monday through Friday with over 30 employees in and out throughout the day. Extended hours occur during emergencies and snow plowing. There are no full-time occupants in the Parks garage; personnel access the garage to obtain required equipment.

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 details the results of the Borough of Tenafly Department of Public Works (DPW) Parks garage, a 6,000 square foot, two story structure, located at the DPW complex. The building consists of a breakroom, repair shop, storage loft, and large vehicle area. The facility does not full-time occupancy; DPW employees access the facility as required for equipment.
The following areas were evaluated for energy conservation measures:

- Lighting replacement
- Domestic hot water heater

Potential Energy Conservation Measures (ECMs) were identified for the above categories. Potential annual saving of $1,700 for the recommended ECMs may be realized with a payback of 4.7 years.

The ECMs identified in this report will allow for the building to reduce its energy usage and if pursued has the opportunity to qualify for the New Jersey SmartStart Buildings Program. A summary of the costs, savings, and paybacks for the recommended ECM follows:

ECM-1 Replace Electric Domestic Hot Water Heater

Budgetary Cost	Annual Utility Savings					Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Water	Total						
$	kW	kWh	Therms	kGals	$	$	$		$	Years	Years
3,400	1.5	1,240	(30)	0	300	0	300	0.2	300	11.3	10.3

* Incentive shown is per the New Jersey Smart Start Program, Gas Water Heating Application. See section 5.0 for other incentive opportunities.

ECM-2 Lighting Replacements

Budgetary Cost	Annual Utility Savings					Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Water	Total						
$	kW	kWh	Therms	kGals	$	$	$		$	Years	Years
6,400	3.6	7,140	0	0	1,400	0	1,400	2.2	1,500	4.6	3.5

* Incentive shown is per the New Jersey Smart Start Program, Prescriptive Lighting Application. Also, this measure is potentially eligible for Direct Install funding. See section 5.0 for other incentive opportunities.

3.0 EXISTING CONDITIONS

3.1 Building - General

The Borough of Tenafly DPW Parks garage, constructed in 2005, is a 6,000 square foot two story facility within the DPW complex. The building includes a breakroom, restroom, repair shop, storage loft, and vehicle area. The garage has no full-time occupants.

The Tenafly DPW complex operates from 7:00 AM to 3:00 PM, Monday through Friday with over 30 employees in and out throughout the day. Extended hours occur during emergencies and snow plowing.

Exterior walls of the building consist of corrugated steel siding over 8" wooden framing with batt insulation and additional corrugated steel siding on the interior. The pitched roof is also corrugated steel with batt insulation, and a corrugated steel ceiling. Five insulated steel overhead doors provide vehicle access to the garage. These include a 20' wide by 14' foot tall overhead door on the east wall; a 12' x 14' door on the north wall; and two 14' x 14' and one 20' x 14' doors on the west wall. All door seals are in good condition. Four insulated steel security type man doors provide access to the building. The building envelope is in excellent condition.

3.2 Utility Usage

Utilities include electricity, natural gas, and potable water. Electricity and natural gas are purchased from Public Service Electric & Gas Company (PSE&G). Potable water is provided by United Water New Jersey on a shared account with the DPW complex.

From March 2009 through February 2010, electric usage was approximately 21,920 kWh at a cost of about $3,900. Reviewing electricity bills during this period showed that the building was charged at the following rates: supply unit cost of $0.125 per kWh; demand unit cost of $11.32 per kW; and a blended unit cost of $0.178 per kWh. During the same timeframe, the building heat produced by natural gas-fired equipment required about 5,410 therms. Based on the annual cost of about $6,300, the blended price for natural gas was $1.163 per therm. Electricity and natural gas consumption are highest in the winter months when the building is in heating mode. Utility data can be found in Appendix A.

Electricity and natural gas commodity supply and delivery is purchased from PSE&G. The delivery component will always be the responsibility of the utility that connects the facility to the power grid or gas line; however, the supply can be purchased from a third party. The electricity or natural gas 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 and natural gas energy co mmodity suppliers can be found in Appendix A. According to the U.S. Energy Information Administration, the average commercial unit costs of electricity and natural gas in New Jersey during July 2010 was $0.152 per kWh and $1.09 per therm. Based on the fact that the building is currently paying above the state average for electricity and natural gas, it is recommended that a third party supplier be pursued for both utilities.

3.3 HVAC Systems

Heat for the breakroom is provided by a 5 ft. long electric baseboard heating unit. Similarly, the restroom is heated by a 30" electric baseboard unit. The remainder of the building utilizes four 40 ft. long, Roberts Gordon low-intensity, gas-fired infrared tube heaters with an input of 115,000 Btuh each.

Ventilation is provided by four exhaust fans located on the east wall. Two of the fans are outblast type and ducted near to the floor for vehicle exhaust. The other two fans exhaust air from near the ceiling. All four fans are switch operated and interlocked with operable dampers on the north and south walls for make-up air.

3.4 Lighting/Electrical Systems

The main area of the DPW Parks garage utilizes (13) 400 watt metal halide fixtures and (4) 8', 2-lamp T-12 fluorescent lighting fixtures. There are five 8', 2-lamp T-12 fluorescent fixtures; three in the shop area and two in the loft. Two 2'x4' 4-lamp T-12 fixtures are used in the breakroom and one in the restroom. All interior fixtures are switch operated, considered inefficient by today's standards. Exterior lights include (3) 100 watt metal halide fixtures and (13) flood lamps ranging from 50 to 75 watts. Most exterior lighting is switch operated; flood lamps located over man doors utilize photocells.

3.5 Control Systems

The (4) infrared heaters are controlled by dedicated mechanical thermostats with an average temperature setpoint of about 60°F. The two electric baseboard heating units are equipped with temperature dials which were turned off at the time of the audit. As previously noted, all four exhaust fans are switch operated and interlocked with operable dampers for make-up air.

3.6 Plumbing Systems

Domestic hot water is produced by a 12 gallon, 1,500 watt Bradford White electric water heater. The restroom contains a hand sink and toilet. Additionally, the building exterior is equipped with several hose bibs.

4.0 ENERGY CONSERVATION MEASURES

4.1 ECM-1 Replace Electric Domestic Hot Water Heater

Domestic hot water is generated by a 12 gallon, 1,500 watt electric hot water heater. Due to a low demand for hot water in the building, there are extended periods of time with little or no use. However, the unit must still heat the water within the storage tank. Energy required maintaining the hot water temperature setpoint during times of zero demand are known as standby losses. This measure evaluates replacing the existing DHW heater with a tankless, gas-fired, condensing hot water heater to eliminate standby losses.

According to the U.S. Department of Energy, 2.5% of stored capacity is lost every hour during hot water heater standby. This value was applied to the total volume of the existing hot water heater storage tank to determine the annual standby losses. Proposed efficiency was based on the Navien CR180 tankless, condensing hot water heater; it was calculated that 1,240 kWh would be saved per year. A more detailed hot water demand analysis may be necessary to verify proper sizing. The new water heater will require gas piping, venting, electrical connections, and minor water piping.

Tankless hot water heaters have an expected life of 13 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 16,120 kWh and (390) therms, totaling $3,900.

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

ECM-1 Replace Electric Domestic Hot Water Heater

Budgetary Cost	Annual Utility Savings					Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Water	Total						
$	kW	kWh	Therms	kGals	$	$	$		$	Years	Years
3,400	1.5	1,240	(30)	0	300	0	300	0.2	300	11.3	10.3

* Incentive shown is per the New Jersey Smart Start Program, Gas Water Heating Application. See section 5.0 for other incentive opportunities.

This measure is recommended.

4.2 ECM-2 Lighting Replacements

Various spaces utilize (12) lighting fixtures with inefficient T-12 lamps and magnetic ballasts. In addition, primary lighting for the garage area is provided by (13) 400 watt metal halide lighting fixtures. Energy can be saved by upgrading the T-12 fixtures to use more energy efficient T-8 lamps and electronic ballasts, and upgrading the 400 watt metal halide fixtures with high-output T-5 fluorescent lamps.

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 7,140 kWh per year. Supporting calculations, including all assumptions for lighting hours, and the annual energy usage for each fixture can be found in Appendix C.

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 107,100 kWh, totaling $21,000.

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

ECM-2 Lighting Replacements

Budgetary Cost	Annual Utility Savings					Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Water	Total						
$	kW	kWh	Therms	kGals	$	$	$		$	Years	Years
6,400	3.6	7,140	0	0	1,400	0	1,400	2.2	1,500	4.6	3.5

* Incentive shown is per the New Jersey Smart Start Program, Prescriptive Lighting Application. Also, this measure is potentially eligible for Direct Install funding. See section 5.0 for other incentive opportunities.

This measure is 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. However, the 200 kW/month average minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations. 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.

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.

5.1.3 Energy Efficient and Conservation Block Grant

Following is a brief summary of the Energy Efficient and Conservation Block Grant (EECBG) program. The Energy Efficiency and Conservation Block Grant Complete Program Application Package should be consulted for rules and regulations.

Additional funding is available to local government entities through the EECBG, a part of New Jersey's Clean Energy program (NJCEP). The grant is for local government entities only, and can offset the cost of energy reduction implementation to a maximum of $20,000 per building.

This program is provided in conjunction with NJCEP funding and any utility incentive programs; the total amount of the three incentives combined cannot exceed 100% of project cost. Funds shall first be provided by NJCEP, followed by the EECBG and any utility incentives available to the customer. The total amount of the incentive shall be determined TRC Solutions, a third party technical consulting firm for the NJCEP.

In order to receive EECBG incentives, local governments must not have received a Direct Block Grant from the US Department of Energy. A list of the 512 qualifying municipalities and counties is provided on the NJCEP website. Qualifying municipalities must participate in at least one eligible Commercial & Industrial component of the NJCEP, utility incentive programs, or install building shell measures recommended by the Local Government Energy Audit Program. Eligible conservation programs through NJCEP include:

- Direct Install
- Pay for Performance
- NJ SmartStart Buildings for measures recommended by a Local Government Energy Audit (LGEA) or an equivalent audit completed within the last 12 months
- Applicants may propose to independently install building shell measures recommended by a LGEA or an equivalent audit. The audit must have been completed within the past 12 months.
- Any eligible utility energy efficiency incentive program

Most facilities owned or leased by an eligible local government within the State of New Jersey are eligible for this grant. Ineligible facilities include casinos or other gambling establishments, aquariums, zoos, golf courses, swimming pools, and any building owned or leased by the United States Federal Government. New construction is also ineligible.

5.1.4 ARRA Initiative "Energy Efficiency Programs through the Clean Energy Program"

The American Recovery and Reinvestment Act (ARRA) Initiative is available to New Jersey oil, propane, cooperative and municipal electric customers who do not pay the Societal Benefits Charge. This charge can be seen on any electric bill as the line item "SBC Charge." Applicants can participate in this program in conjunction with other New Jersey Clean Energy Program initiatives including Pay for Performance, Local Government Energy Audits, and Direct Install programs.

Funding for this program is dispersed on a first come, first serve basis until all funds are exhausted. The program does not limit the municipality to a minimum or maximum incentive, and the availability of funding cannot be determined prior to application. If the municipality meets all qualifications, the

application must be submitted to TRC Energy Solutions for review. TRC will then determine the amount of the incentive based on projected energy savings of the project. It is important to note that all applications for this incentive must be submitted before implementation of energy conservation measures.

Additional information is available on New Jersey's Clean Energy Program website.

5.1.5 Direct Install Program

The Direct Install Program targets small and medium sized facilities where the peak electrical demand does not exceed 200 kW in any of the previous 12 months. Buildings must be located in New Jersey and served by one of the state's public, regulated electric or natural gas utility companies. On a case-by-case basis, the program manager may accept a project for a customer that is within 10% of the 200 kW peak demand threshold.

The 200 kW peak demand threshold has been waived for local government entities that receive and utilize their Energy Efficiency and Conservation Block Grant as discussed in section 5.1.3 in conjunction with Direct Install.

Direct Install is funded through New Jersey's Clean Energy Program and is designed to provide capital for building energy upgrade projects to fast track implementation. The program will pay up to 60% of the costs for lighting, HVAC, motors, natural gas, refrigeration, and other equipment upgrades with higher efficiency alternatives. If a building is eligible for this funding, the Direct Install Program can significantly reduce the implementation cost of energy conservation projects.

The program pays a maximum amount of $50,000 per building, and up to $250,000 per customer per year. Installations must be completed by a Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website at http://www.njcleanenergy.com. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this document.

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 6,000 square foot building is eligible for about $800 toward development of an Energy Reduction Plan. When calculating the total amount under Incentives #2 and #3, all energy conservation measures are applicable as the amount received is based on building wide energy improvements. Since the overall energy reduction for the building is not estimated to meet the 15% minimum, the building is not eligible to receive monies based on Incentives #2 and #3 as discussed above in section 5.1.1. See Appendix D for calculations.

5.2.2 New Jersey Smart Start Program

The Borough of Tenafly DPW Parks garage is eligible for several incentives available under New Jersey Smart Start Programs. The total amount of all qualified incentives is about $1,800 and includes installing a new tankless gas-fired DHW heater and upgrades to the lighting system.

5.2.3 Energy Efficient and Conservation Block Grant

The Parks garage is owned by local government which makes it eligible for this incentive. The incentive amount is determined by TRC Solutions and is not calculable at this time. Further information about this incentive, including the application, can be found at:
http://www.njcleanenergy.com/commercial-industrial/programs/energy-efficiency-and-conservation-block-grants

5.2.4 Direct Install Program

The Parks garage is potentially eligible to receive funding from the Direct Install Program. This money will be in conjunction with the Energy Efficiency and Conservation Block Grant. The total implementation cost for all ECMs potentially eligible for Direct Install funding is about $6,400. This program would pay 60%, or about $3,800 of these initial costs. This funding has the potential to significantly affect the payback periods of Energy Conservation Measures. For the Parks garage, the Direct Install Program brings the simple payback from about 5.7 years, to approximately 3.5 years.

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 gas-fired infrared heaters to meet the HVAC requirements. This 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 completely removed and a low temperature closed loop water source 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 facility 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 building's roof has sufficient room to install a large solar cell array. A structural analysis would be required to determine if the roof framing could support a cell array.

The PVWATTS solar power generation model was utilized to calculate PV power generation. The New Jersey Clean Power Estimator provided by the New Jersey Clean Energy Program is presently being updated; therefore, the site recommended use of the PVWATT solar grid analyzer version 1. The closest city available in the model is Newark, New Jersey 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 $0.75/watt up to 30 kW of installed PV array with a maximum system capacity of 50 kW. 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 2009 is $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 19.6 kW and a minimum of 2.5 kW, from March 2009 through February 2010. The monthly average over the observed 12 month period was 8.5 kW. The existing load does not justify the use of the maximum incentive cap of 30 kW of installed PV solar array; therefore, an 8 kW system size was selected 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 is currently $8 per watt or $8,000 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 as follows:

Photovoltaic (PV) Rooftop Solar Power Generation – 8 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
64,000	0	9,464	0	1,700	1,700	6,000	4,600	>25	9.2

*Incentive based on New Jersey Renewable Energy Program for non-residential applications of $0.75 per Watt of installed capacity
** Estimated Solar Renewable Energy Certificate Program (SREC) for 15 years at $487/1000 kWh

While the payback period is within the parameters for recommended measures, further investigation of possible installation locations, required system maintenance, and local installation costs are suggested prior to consideration for 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.

Several options exist for using active solar thermal systems for space heating. The most common method involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system). The most practical system would transfer the heat from the panels to thermal storage tanks and transfer solar produced thermal energy to use for domestic hot water production. DHW is presently produced by an electric water heater and, therefore, this measure would offer electrical utility savings.

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 Borough of Tenafly 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	1,450	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 Tenafly area, the map indicates a mean annual wind speed of 10 miles per hour. For the DPW Parks garage, there are site restrictions such as 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.

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 DPW Parks garage has 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. An absorption chiller could be installed to utilize the heat to produce chilled water; however, there is no chilled water distribution system in the building. The most viable selection for a CHP plant at this location would be a reciprocating engine natural gas-fired unit. 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 due to of noise issues. 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

Presently, electricity is delivered by PSE&G, which receives the electricity from regional power grid RFC. PSE&G is the regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia including the State of New Jersey.

Utility Curtailment is an agreement with the PSE&G regional transmission organization 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 PSE&G offers incentives 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 PSE&G pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. The Borough of Tenafly DPW Parks garage had a monthly average electricity demand of 8.5 kW and a maximum demand of 19.6 kW from March 2009 through February 2010.

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

7.0 EPA PORTFOLIO MANAGER

The United States 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 DPW Parks garage is considered an average energy consumer per the Portfolio Manager with a Site Energy Usage Index (EUI) of 103 kBTU/ft^2/year. The EUI can be improved by addressing wasted energy from electric water heating and inefficient lighting systems. By implementing the measures discussed in this report, it is expected that the EUI can be reduced to approximately 98 kBTU/ft^2/year. The EPA Portfolio Manager did not generate an energy rating score for this building because the building type (other) is not eligible for an energy star rating.

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

The user name and password for the building's EPA Portfolio Manager Account has been provided to Bob Beutel, Director of Public Works of the Borough of Tenafly.

8.0 CONCLUSIONS & RECOMMENDATIONS

The energy audit conducted by CHA at the Borough of Tenafly Department of Public Works (DPW) Parks garage in Tenafly, New Jersey identified a potential ECM for electric domestic hot water heater and lighting replacements. Potential annual savings of $1,700 may be realized for the recommended ECM, with a summary of the cost, saving, and payback as follows:

ECM-1 Replace Electric Domestic Hot Water Heater

Budgetary Cost	Annual Utility Savings					Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Water	Total						
$	kW	kWh	Therms	kGals	$	$	$		$	Years	Years
3,400	1.5	1,240	(30)	0	300	0	300	0.2	300	11.3	10.3

* Incentive shown is per the New Jersey Smart Start Program, Gas Water Heating Application. See section 5.0 for other incentive opportunities.

ECM-2 Lighting Replacements

Budgetary Cost	Annual Utility Savings					Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Water	Total						
$	kW	kWh	Therms	kGals	$	$	$		$	Years	Years
6,400	3.6	7,140	0	0	1,400	0	1,400	2.2	1,500	4.6	3.5

* Incentive shown is per the New Jersey Smart Start Program, Prescriptive Lighting Application. Also, this measure is potentially eligible for Direct Install funding. See section 5.0 for other incentive opportunities.

APPENDIX A

Utility Usage Analysis

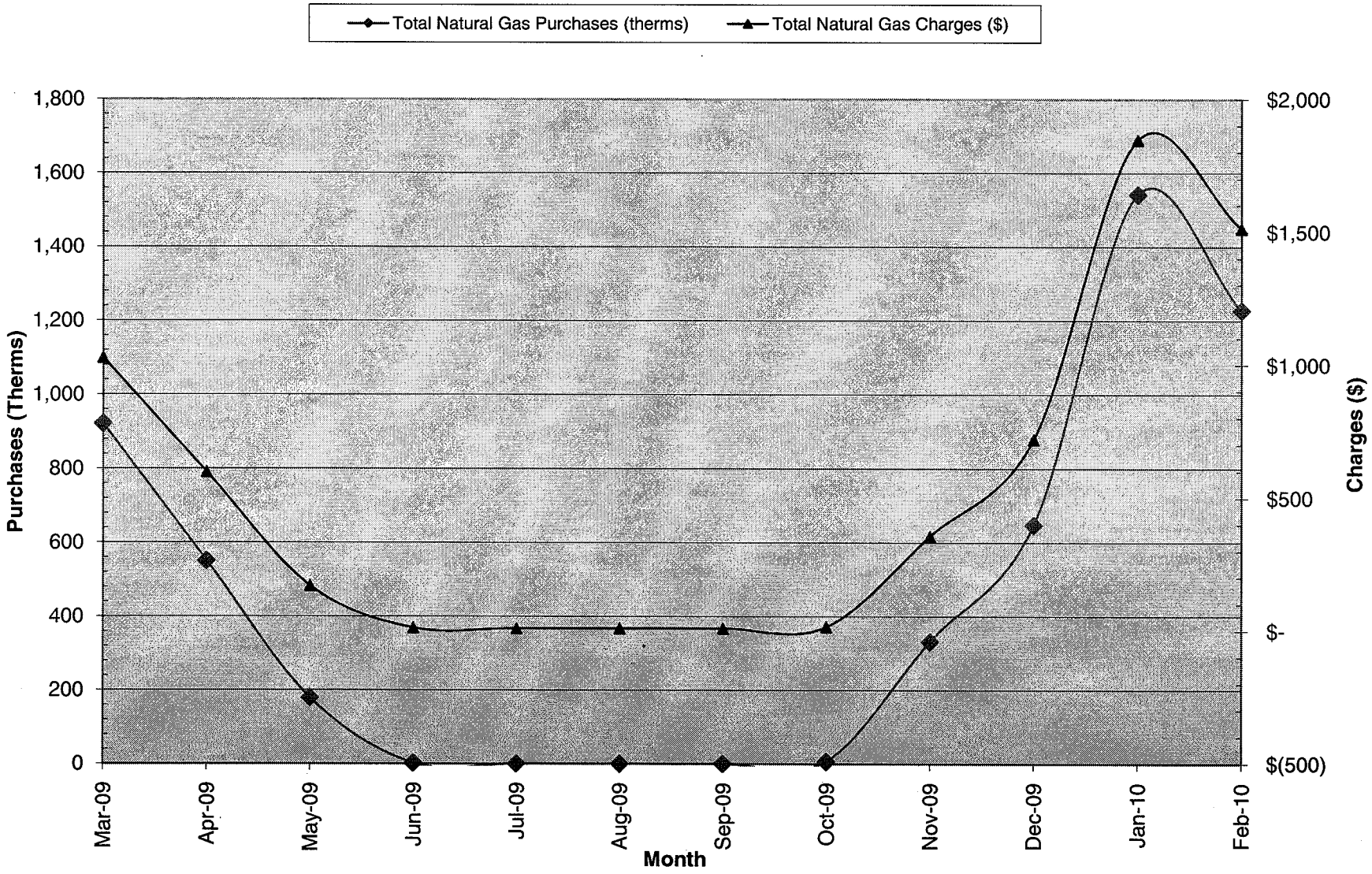
New Jersey BPU Energy Audit Program
CHA Project No.: 21794
Borough of Tenafly
PSE&G - Natural Gas Service

Parks Garage
Account No.: **41 479 401 18**
Meter No.: **2463247**

Month	Therms	Charges ($)	($/Therm)
March-09	921.9	$ 1,026.47	$ 1.113
April-09	550.6	$ 598.30	$ 1.087
May-09	179.3	$ 170.13	$ 0.949
June-09	2.1	$ 11.95	$ 5.690
July-09	0.0	$ 10.12	#DIV/0!
August-09	0.0	$ 10.12	#DIV/0!
September-09	0.0	$ 10.12	#DIV/0!
October-09	6.3	$ 15.69	$ 2.490
November-09	331.5	$ 357.41	$ 1.078
December-09	647.7	$ 721.04	$ 1.113
January-10	1,541.6	$ 1,846.91	$ 1.198
February-10	1,226.8	$ 1,512.44	$ 1.233

Total	5,408	$ 6,290.70	$ 1.163

Natural Gas Usage - Borough of Tenafly DPW Parks Garage



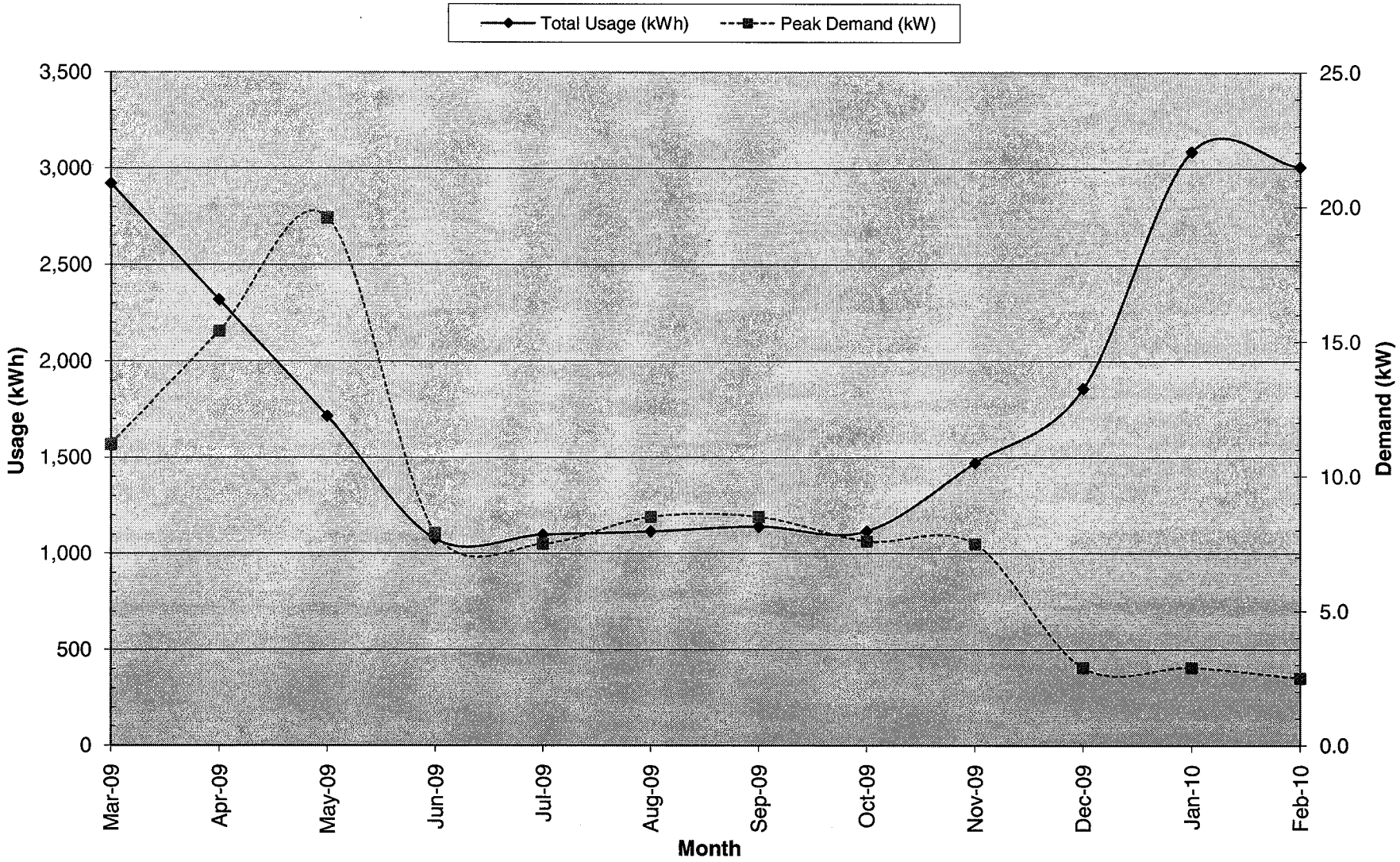
Utility Data - Tenafly.xls
Parks Garage-Natural Gas Chart

New Jersey BPU Energy Audit Program
CHA Project No.: 21794
Borough of Tenafly
PSE&G - Electric Service

Parks Garage
Account No.: **41 479 402 18**
Meter No.: **626042910**

			Charges			Unit Costs		
Month	Consumption (kWh)	Demand (kW)	Total ($)	Demand ($)	Consumption ($)	Blended Rate ($/kWh)	Consumption ($/kWh)	Demand ($/kW)
March-09	2,921	11.2	$446.34	$88.36	$357.98	$ 0.153	$ 0.123	$ 7.89
April-09	2,318	15.4	$366.62	$85.70	$280.93	$ 0.158	$ 0.121	$ 5.56
May-09	1,715	19.6	$286.90	$83.03	$203.87	$ 0.167	$ 0.119	$ 4.24
June-09	1,076	7.9	$279.78	$134.94	$144.84	$ 0.260	$ 0.135	$ 17.08
July-09	1,098	7.5	$294.37	$132.57	$161.80	$ 0.268	$ 0.147	$ 17.68
August-09	1,114	8.5	$309.40	$143.76	$165.64	$ 0.278	$ 0.149	$ 16.91
September-09	1,140	8.5	$311.16	$143.71	$167.45	$ 0.273	$ 0.147	$ 16.91
October-09	1,116	7.6	$223.57	$78.97	$144.60	$ 0.200	$ 0.130	$ 10.39
November-09	1,471	7.5	$254.12	$79.24	$174.88	$ 0.173	$ 0.119	$ 10.57
December-09	1,857	2.9	$280.47	$60.82	$219.65	$ 0.151	$ 0.118	$ 20.97
January-10	3,086	2.9	$426.92	$61.97	$364.95	$ 0.138	$ 0.118	$ 21.37
February-10	3,007	2.5	$418.04	$61.31	$356.73	$ 0.139	$ 0.119	$ 24.52
Total	21,919	19.6	$3,897.69	$1,154.38	$2,743.32	$ 0.178	$ 0.125	$ 11.32

Electric Usage - Borough of Tenafly DPW Parks Garage



Utility Data - Tenafly.xls
Parks Garage-Electricity Chart

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

UGI Energy Services, Inc.
d/b/a POWERMARK
1 Meridian Blvd. Suite 2C01
Wyomissing, PA 19610
(800) 427-8545
www.ugienergyservices.com

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

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

Jan 14, 2009

GAS MARKETERS LIST

The following is a listing of marketers/suppliers/brokers that have been licensed by the NJ Board of Public Utilities to sell natural gas 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.**

Gateway Energy Services
44 Whispering Pines Lane
Lakewood, NJ 08701
(800) 805-8586
www.gesc.com

Metro Energy Group, LLC
14 Washington Place
Hackensack, NJ 07601
www.metroenergy.com

RPL Holdings, Inc
601 Carlson Pkwy
Minnetonka, MN 55305

Great Eastern Energy
3044 Coney Island Ave. PH
Brooklyn, NY 11235
888-651-4121
www.greateasterngas.com

Metromedia Energy, Inc.
6 Industrial Way
Eatontown, NJ 07724
(800) 828-9427
www.metromediaenergy.com

South Jersey Energy Company
One South Jersey Plaza, Rte 54
Folsom, NJ 08037
(800) 756-3749
www.sjindustries.com/sje.htm

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095
(800) 437-7872
www.hess.com

Mitchell- Supreme Fuel
(NATGASCO)
532 Freeman Street
Orange, NJ 07050
(800) 840-4GAS
www.mitchellsupreme.com

Sprague Energy Corp.
Two International Drive, Ste 200
Portsmouth, NH 03801
800-225-1560
www.spragueenergy.com

Hudson Energy Services, LLC
545 Route 17 South
Ridgewood, NJ 07450
(201) 251-2400
www.hudsonenergyservices.com

MxEnergy Inc.
P.O. Box 177
Annapolis Junction, MD 20701
800-375-1277
www.mxenergy.com

Stuyvesant Energy LLC
642 Southern Boulevard
Bronx, NY 10455
(718) 665-5700
www.stuyfuel.com

Intelligent Energy
7001 SW 24th Avenue
Gainesville, FL 32607
Sales: 1 877 I've Got Gas
(1 877 483-4684)
Customer Service:
1 800 927-9794
www.intelligentenergy.org

Pepco Energy Services, Inc.
23 S Kinderkamack Rd, Suite D
Montvale, NJ 07645
(800) 363-7499
www.pepco-services.com

Tiger Natural Gas, Inc.
1422 E. 71st Street, Suite J.
Tulsa, OK 74136
1-888-875-6122
www.tigernaturalgas.com

Systrum Energy
877-SYSTRUM
(877-797-8786)
www.systrumenergy.com

Plymouth Rock Energy, LLC
165 Remsen Street
Brooklyn, NJ 11201
866-539-6450
www.plymouthrockenergy.com

UGI Energy Services, Inc.
d/b/a GASMARK
704 E. Main Street, Suite I
Moorestown, NJ 08057
856-273-9995
www.ugienergyservices.com

Macquarie Cook Energy, LLC
10100 Santa Monica Blvd, 18th
Fl
Los Angeles, CA 90067

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

Woodruff Energy
73 Water Street
P.O. Box 777
Bridgeton, NJ 08302
(856) 455-1111
www.woodruffenergy.com

APPENDIX B

ECM-1 Replace Electric Domestic Hot Water Heater

NJBPU - Borough of Tenafly
CHA #21794
Building: DPW Parks Garage

ECM-1 Replace Electric DHW Heater

Summary

* Replace Electric DHW Heater w/ Tankless, Condensing, Gas-Fired DHW Heater

Item	Value	Units	Formula/Comments
Occupied days per week	5	days/wk	
Water supply Temperature	50	°F	Termperature of water coming into building
Hot Water Temperature	120	°F	
Hot Water Usage per day	19	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	2,843	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint
Existing Tank Size	12	Gallons	Per manufacturer nameplate
Hot Water Temperature	120	°F	Per building personnel
Average Room Temperature	60	°F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.2	MBH	
Annual Standby Hot Water Load	1,314	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	4,157	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	98%		Per Manufacturer
Total Annual Energy Required	4,241	Mbtu/yr	
Total Annual Electric Required	1,243	**kWh/yr**	**Electrical Savings**
Average Annual Electric Demand	0.14	kW	
Peak Electric Demand	**1.50**	**kW**	**Per Manufacturer's Nameplate (Demand Savings)**
New Tank Size	0	Gallons	tankless
Hot Water Temperature	120	°F	
Average Room Temperature	60	°F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.0	MBH	
Annual Standby Hot Water Load	0	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	2,843	MBTU/yr	
Proposed Avg. Hot water heater efficiency	92%		Based on Navien CR180 tankless, condensing DHW Heater
Proposed Total Annual Energy Required	3,100	MBTU/yr	
Proposed Fuel Use	31	Therms/yr	Standby Losses and inefficient DHW heater eliminated
Elec Utility Demand Unit Cost	$11.32	$/kW	
Elec Utility Supply Unit Cost	$0.13	$/kWh	
NG Utility Unit Cost	$1.16	$/Therm	
Existing Operating Cost of DHW	$359	$/yr	
Proposed Operating Cost of DHW	$36	$/yr	
Annual Utility Cost Savings	**$323**	**$/yr**	

Daily Hot Water Demand

FIXTURE	*BASE WATER USE GPM	DURATION OF USE (MIN)	#USES PER DAY MALE	#USES PER DAY FEMALE	FULL TIME OCCUPANTS** MALE	FULL TIME OCCUPANTS** FEMALE	TOTAL GAL/DAY	% HOT WATER	TOTAL HW GAL/DAY
LAVATORY (Low-Flow Lavs use 0.5 GF	2.5	0.25	1	1	15	0	9	50%	5
SHOWER	2.5	5	1	1	0	0	0	75%	0
UTILITY SINK	2.5	0.5	1	1	15	0	19	75%	14
MOP SINK	2.5	2	1	1	0	0	0	75%	0
Dishwasher (ga	10	1	1	1	0	0	0	100%	0
						TOTAL	28		19

*GPM is per standard fixtures, adjust as necessary if actual GPM is known.
**These are the occupanct that use the fixtures. If fixture does not exist change to (0).

NJBPU - Borough of Tenafly
CHA #21794
Building: DPW Parks Garage

ECM-1 Replace Electric DHW Heater

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.		
						$ -	$ -	$ -	$ -	
Electric DHW Heater Removal	1	LS		$ 50		$ -	$ 61	$ -	$ 61	
						$ -	$ -	$ -	$ -	
Instantaneous Gas-Fired DHW Heater	1	EA	$ 1,200	$ 280		$ 1,176	$ 339	$ -	$ 1,515	
Miscellaneous Electrical	1	LS	$ 50	$ 75		$ 49	$ 91	$ -	$ 140	
Venting	20	LF	$ 5.50	$ 6.70		$ 108	$ 162	$ -	$ 270	PVC piping
Miscellaneous Piping and Valves	1	LS	$ 500	$ 300		$ 490	$ 363	$ -	$ 853	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

$ 2,838		Subtotal
$ 284	10%	Contingency
$ 312	10%	Contractor O&P
$ -	0%	Engineering
$ 3,434		**Total**

New Jersey Smart Start Incentive Program	QTY	UNIT	$ / UNIT	TOTAL SAVINGS	Cost W/O INCENTIVE	Cost W/ INCENTIVE
Tankless Water Heater	1	EA	$300	$300	$ 1,515	$ 1,215
				$300	$1,515	$1,215

Total ECM Cost w/ Incentives	**$3,134**

APPENDIX C

ECM-2 Lighting Replacements

NJBPU - Borough of Tenafly
CHA #21794
Building: DPW Parks Garage

ECM-2 Lighting Replacements

Building Schedule:
Existing conditions: hrs/week
Supply Electric Rate $ 0.125 /kWh
Demand Rate $ 11.00 /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
Shop Area	3	F82SE	158	0	161.16	0.474	switch	8	2,080	986	3	F82ILL-R	98	0.294	switch	8	2,080	612	0	374	$ 71	$ 389	5.5
Restroom	1	F44ES	160	0	163.2	0.16	switch	2	520	83	1	F44ILL-R	102	0.102	switch	2	520	53	0	30	$ 12	$ 130	11.1
Break Room	2	F44ES	160	0	163.2	0.32	switch	4	1,040	333	2	F44ILL-R	102	0.204	switch	4	1,040	212	0	121	$ 31	$ 259	8.4
Storage Lofts	2	F82SE	158	0	161.16	0.316	switch	2	520	164	2	F82ILL-R	98	0.196	switch	2	520	102	0	62	$ 24	$ 259	10.8
Garage	4	F82SE	158	0	161.16	0.632	switch	8	2,080	1,315	4	F82ILL-R	98	0.392	switch	8	2,080	815	0	499	$ 95	$ 519	5.5
Garage	13	MH400/1	458	0	467.16	5.954	switch	8	2,080	12,384	13	F44GHL	234	3.042	switch	8	2,080	6,327	3	6,057	$ 1,153	$ 4,888	4.2
TOTALS -	25			0		7.9				15,265	25			4.2				8,121	3.6	7,144	$ 1,386	$ 6,444	4.7

New Jersey Smart Start Incentive Program	QTY	UNIT	$ / UNIT	TOTAL SAVINGS	Cost W/O INCENTIVE	Cost W/ INCENTIVE
T-12 Lighting Retrofit	12	EA	$15	$180	$ 1,556	$ 1,376
Metal Halide Replacement	13	EA	$100	$1,300	$ 4,888	$ 3,588
				$1,480	$6,444	$4,964

Total ECM Cost w/ Incentives	$4,964

APPENDIX D

New Jersey Pay For Performance Incentive Program

NJBPU - Borough of Tenafly
CHA #21794
Building: DPW Parks Garage

New Jersey Pay For Performance Incentive Program

Note: The following calculation is based on the New Jersey Pay For Performance Incentive Program per April, 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)	6,000
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)	$3,900	$6,300
Existing Usage (from utility)	21,919	5,408
Proposed Savings	8,390	(30)
Existing Total MMBtus	616	
Proposed Savings MMBtus	26	
% Energy Reduction	**4.2%**	
Proposed Annual Savings	$1,700	

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

*Building shares electric meter w/ others @ DPW complex. Usage and cost estimated per building size and equipment.

	Incentives $		
	Elec	Gas	Total
Incentive #1	$0	$0	$300
Incentive #2	$0	$0	$0
Incentive #3	$0	$0	$0
Total All Incentives	**$0**	**$0**	**$300**

Total Project Cost	$9,900

		Allowable Incentive
% Incentives #1 of Utility Cost*	2.9%	$300
% Incentives #2 of Project Cost**	0.0%	$0
% Incentives #3 of Project Cost**	0.0%	$0
Total Eligible Incentives***	**$300**	
Project Cost w/ Incentives	$9,600	

Project Payback (years)	
w/o Incentives	w/ Incentives
5.8	5.6

* 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 is 30% of total project cost.
Maximum allowable amount of Incentive #3 is 20% 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 $1 million per gas account and $1 million per electric account

APPENDIX E

Photovoltaic (PV) Rooftop Solar Power Generation

Borough of Tenafly
DPW Parks Garage

Cost of Electricity	$0.178	$/kWh
System Capacity	8.0	kW

Photovoltaic (PV) Rooftop Solar Power Generation

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
$64,000	**0.0**	**9,464**	**0**	**$1,700**	**0**	**$1,700**	**$6,000**	**$4,600**	**37.6**	**9.2**

Note: Budgetary cost is based on $8,000/kW.

*Incentive based on New Jersey renewable energy program for non-residential applications(PV)= $0.75/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

(Type comments here to appear on printout; maximum 1 row of 80 characters.)

Station Identification	
City:	Newark
State:	New_Jersey
Latitude:	40.70° N
Longitude:	74.17° W
Elevation:	9 m
PV System Specifications	
DC Rating:	8.0 kW
DC to AC Derate Factor:	0.770
AC Rating:	6.2 kW
Array Type:	Fixed Tilt
Array Tilt:	40.7°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	17.8 ¢/kWh

Results

Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	3.36	662	117.84
2	4.05	715	127.27
3	4.58	867	154.33
4	4.84	848	150.94
5	5.30	934	166.25
6	5.33	881	156.82
7	5.27	890	158.42
8	5.25	880	156.64
9	5.06	854	152.01
10	4.46	804	143.11
11	3.15	574	102.17
12	2.87	554	98.61
Year	4.46	9464	1684.59

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

RReDC Return to RReDC home page (http://rredc.nrel.gov)

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)	1.5	? Water Inlet Temperature (Degrees F)	50
? Capacity (gallons)	12	? Ambient Temperature (Degrees F)	60
? Surface Area (calculated - sq ft)	7.812	? Hot Water Temperature (Degrees F)	135
? Effective R-value	NaN	? Hot Water Usage (Gallons per Day)	19
Energy Use			
552.5		? Heat Delivered in Hot Water (BTU/hr)	
0		? Heat loss through insulation (BTU/hr)	

Gas vs. Electric Water Heating		
Gas		**Electric**
0.8	? Overall Efficiency	0.98
0.8	? Conversion Efficiency	0.98
690.6 BTU/hr	? Power Into Water Heater	563.8 BTU/hr
Cost		
$ 1.163 /Therm	? Utility Rates	$ 0.178 /kWh
$ 70.3574	? Yearly Water Heating Cost	$ 257.472
How Does Solar Compare?		
? Solar Water Heater Cost: $ 27100		? Percentage Solar: 70
550.251 years for gas	? Payback Time for Solar System	150.362 years for electric

NJBPU Energy Audits
CHA #21794
Borough of Tenafly - DPW Parks Garage

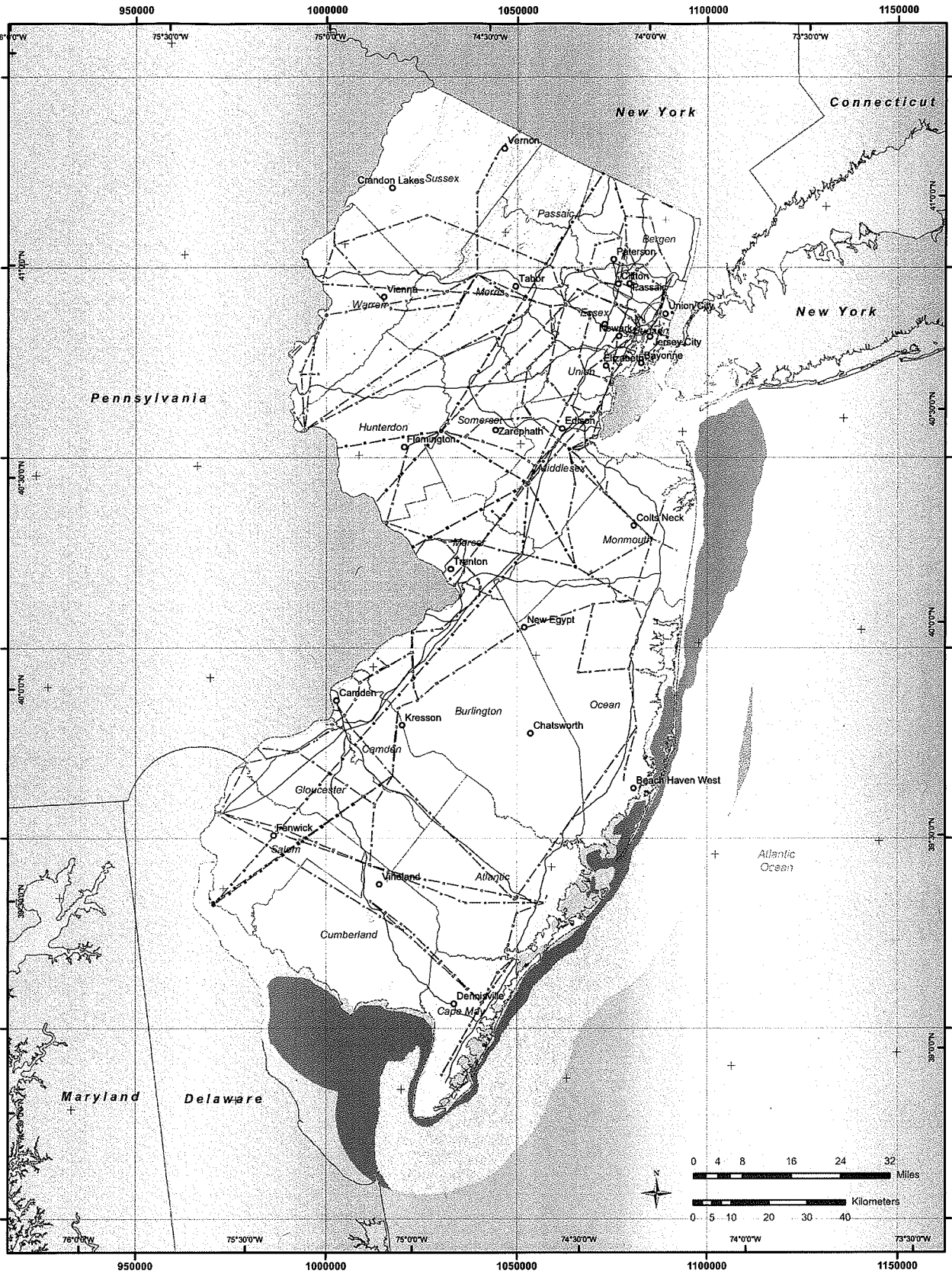
Multipliers	
Material:	0.98
Labor:	1.21
Equipment:	1.09

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



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.

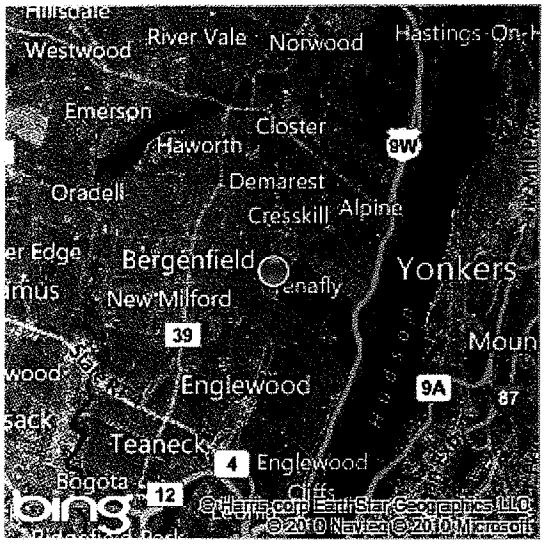
The transmission line information was obtained by AWS Truewind from the Global Energy Decisions Velocity Suite. AWS does not warrant the accuracy of the transmission line information.

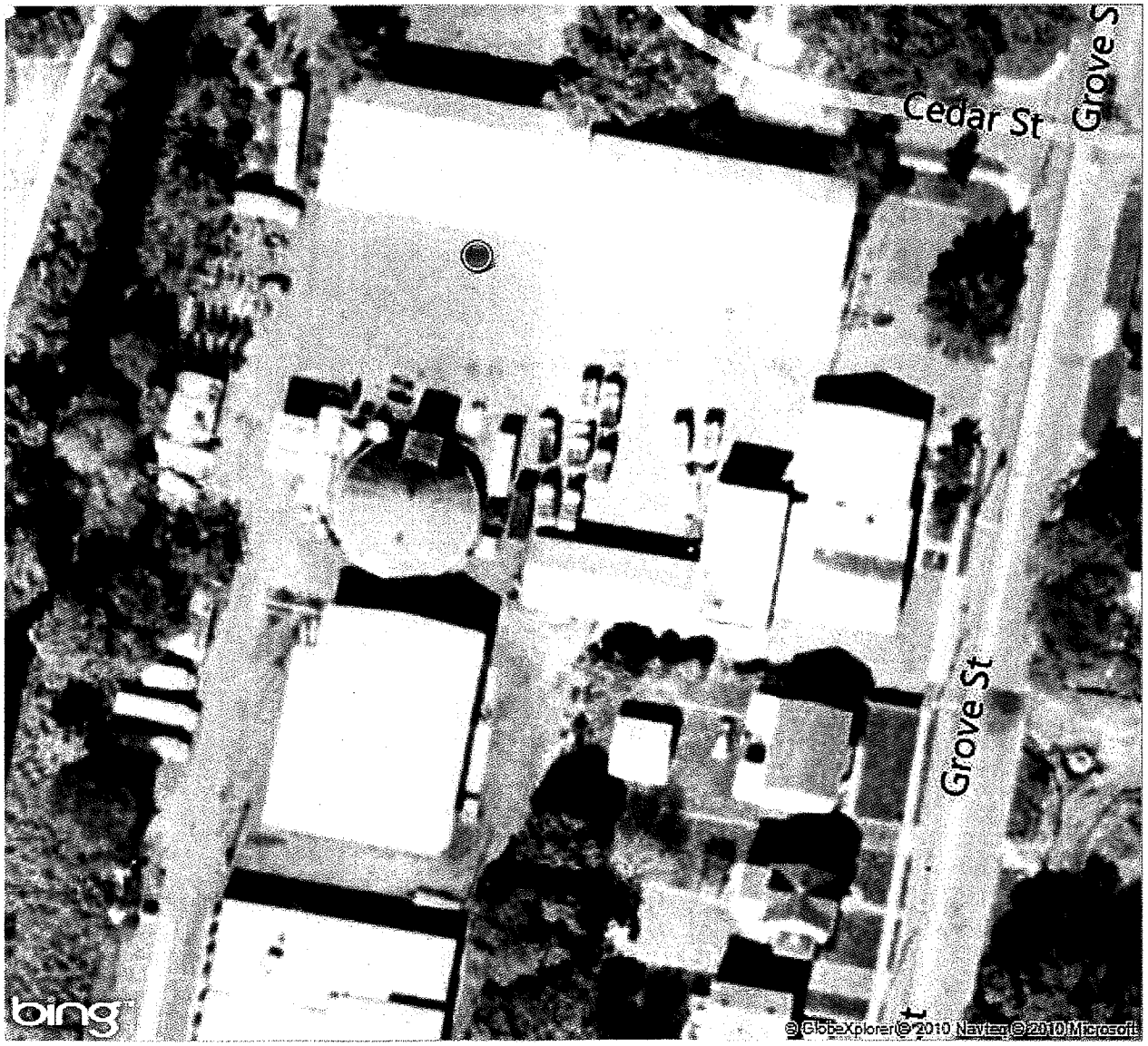
Print

Bing Maps

107 Grove St, Tenafly, NJ 07670-1720

My Notes





APPENDIX H

EPA Portfolio Manager

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
DPW Parks Garage

Building ID: 2413329
For 12-month Period Ending: February 28, 2010[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: August 19, 2010

Facility
DPW Parks Garage
107 Grove Street
Tenafly, NJ 07670

Facility Owner
Tenafly Department of Public Works
107 Grove Street
Tenafly, NJ 07670

Primary Contact for this Facility
Robert Beutel
107 Grove Street
Tenafly, NJ 07670

Year Built: 2005
Gross Floor Area (ft²): 6,000

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

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	74,788
Natural Gas (kBtu)[4]	540,780
Total Energy (kBtu)	615,568

Energy Intensity[5]

Site (kBtu/ft²/yr)	103
Source (kBtu/ft²/yr)	136

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	40

Electric Distribution Utility
Public Service Elec & Gas Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	-36%
Building Type	Other

Stamp of Certifying Professional

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

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) or a Registered Architect (RA) 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 or RA 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	DPW Parks Garage	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	107 Grove Street, Tenafly, NJ 07670	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		☐

Parks Garage (Other)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	6,000 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.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	40Hours(Optional)	Is this the total number of hours per week that the 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	10(Optional)	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.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Public Service Elec & Gas Co

Fuel Type: Electricity

Meter: PSE&G Electric (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
02/01/2010	02/28/2010	3,007.00
01/01/2010	01/31/2010	3,086.00
12/01/2009	12/31/2009	1,857.00
11/01/2009	11/30/2009	1,471.00
10/01/2009	10/31/2009	1,116.00
09/01/2009	09/30/2009	1,140.00
08/01/2009	08/31/2009	1,114.00
07/01/2009	07/31/2009	1,098.00
06/01/2009	06/30/2009	1,076.00
05/01/2009	05/31/2009	1,715.00
04/01/2009	04/30/2009	2,318.00
03/01/2009	03/31/2009	2,921.00
PSE&G Electric Consumption (kWh (thousand Watt-hours))		**21,919.00**
PSE&G Electric Consumption (kBtu (thousand Btu))		**74,787.63**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**74,787.63**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

Meter: PSE&G Natural Gas (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
02/01/2010	02/28/2010	1,226.80
01/01/2010	01/31/2010	1,541.60
12/01/2009	12/31/2009	647.70
11/01/2009	11/30/2009	331.50
10/01/2009	10/31/2009	6.30
09/01/2009	09/30/2009	0.00
08/01/2009	08/31/2009	0.00
07/01/2009	07/31/2009	0.00
06/01/2009	06/30/2009	2.10
05/01/2009	05/31/2009	179.30

04/01/2009	04/30/2009	550.60
03/01/2009	03/31/2009	921.90
PSE&G Natural Gas Consumption (therms)		**5,407.80**
PSE&G Natural Gas Consumption (kBtu (thousand Btu))		**540,780.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**540,780.00**
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.	☐

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 PE or RA 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
DPW Parks Garage
107 Grove Street
Tenafly, NJ 07670

Facility Owner
Tenafly Department of Public Works
107 Grove Street
Tenafly, NJ 07670

Primary Contact for this Facility
Robert Beutel
107 Grove Street
Tenafly, NJ 07670

General Information

DPW Parks Garage	
Gross Floor Area Excluding Parking: (ft^2)	6,000
Year Built	2005
For 12-month Evaluation Period Ending Date:	February 28, 2010

Facility Space Use Summary

Parks Garage	
Space Type	Other - Other
Gross Floor Area(ft^2)	6,000
Number of PCs°	0
Weekly operating hours°	40
Workers on Main Shift°	10

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2010)	**Baseline** (Ending Date 02/28/2010)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft^2)	103	103	0	N/A	104
Source (kBtu/ft^2)	136	136	0	N/A	213
Energy Cost					
$/year	N/A	N/A	N/A	N/A	N/A
$/$ft^2$/year	N/A	N/A	N/A	N/A	N/A
Greenhouse Gas Emissions					
$MtCO_2e$/year	40	40	0	N/A	41
$kgCO_2e/ft^2$/year	7	7	0	N/A	7

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

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
CHA #21794
Borough of Tenafly - DPW Parks Garage

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size/Efficiency	Location	Areas Served	Date Installed	Remaining Useful Life (years)	Other Info.
Domestic Hot Water Heater	1	Bradford White	MI12UT6SS13	-	Hot water / Electric	1,500 watts; 12 gals	Garage	Restroom / Utility sink	2002	6	Excellent condition
Air Compressor	1	Ingersoll Rand	2340L5 W0/STRUP K	402170168	Compressed Air	5 HP; 60 gal Vertical tank	Garage	Garage	2002	-	Excellent condition
Infrared Heater	4	Roberts Gordon	GordonRay BH-115	Varies	Heating / Natural Gas	40 ft; 115,000 Btuh input	Garage	Garage	2002	5	Excellent condition
Exhaust Fan	2	-	-	-	Exhaust / Electric	1 HP	Wall	Garage	2002	17	Excellent condition
Outblast Exhaust Fan	2	-	-	-	Exhaust / Electric	-	Wall	Garage	2002	17	Excellent condition