



Borough of Westwood
June 2010

Final Energy Audit Report

Contents

Executive Summary

Section 1 Introduction

1.1	General	1-1
1.2	Background	1-1
1.3	Purpose and Scope	1-2

Section 2 Facility Description

2.1	Borough Hall	2-1
2.1.1	Description of Building Envelope	2-1
2.1.2	Description of Building HVAC	2-1
2.1.3	Description of Building Lighting	2-2
2.2	Public Library.....	2-2
2.2.1	Description of Building Envelope	2-2
2.2.2	Description of Building HVAC	2-2
2.2.3	Description of Building Lighting	2-3
2.3	DPW Main Building.....	2-3
2.3.1	Description of Building Envelope	2-3
2.3.2	Description of Building HVAC	2-4
2.3.3	Description of Building Lighting	2-4
2.4	DPW Garage.....	2-4
2.4.1	Description of Building Envelope	2-4
2.4.2	Description of Building HVAC	2-4
2.4.3	Description of Building Lighting	2-4
2.5	Fire Department.....	2-5
2.5.1	Description of Building Envelope	2-5
2.5.2	Description of Building HVAC	2-5
2.5.3	Description of Building Lighting	2-5

Section 3 Baseline Energy Use

3.1	Utility Data Analysis	3-1
3.1.1	Electrical Charges	3-1
3.1.2	Natural Fuel Charges.....	3-2
3.2	Facility Results	3-2
3.2.1	Borough Hall.....	3-2
3.2.2	Public Library.....	3-4
3.2.3	DPW Main Building.....	3-5
3.2.4	DPW Garage.....	3-7
3.2.5	Fire Department.....	3-9
3.3	Aggregate Costs.....	3-11
3.4	Portfolio Manager.....	3-12

3.4.1	Portfolio Manager Overview	3-12
3.4.2	Energy Performance Rating.....	3-12
3.4.3	Portfolio Manager Account Information.....	3-13
Section 4	Energy Conservation and Retrofit Measures (ECRM)	
4.1	Building Lighting Systems	4-2
4.1.1	Borough Hall.....	4-2
4.1.2	Public Library.....	4-4
4.1.3	DPW Main Building.....	4-5
4.1.4	DPW Garage.....	4-6
4.1.5	Fire Department.....	4-8
4.2	HVAC Systems	4-9
4.2.1	Borough Hall.....	4-9
4.2.2	Public Library.....	4-16
4.2.3	DPW Main Building.....	4-21
4.2.4	DPW Garage.....	4-23
4.2.5	Fire Department.....	4-26
4.3	Additional Alternative Energy Sources	4-28
4.3.1	Photovoltaic Solar Energy System Overview	4-28
4.3.1.1	Borough Hall.....	4-29
4.3.1.2	Public Library.....	4-30
4.3.1.3	DPW Main Building.....	4-30
4.3.1.4	DPW Garage.....	4-31
4.3.1.5	Fire Department.....	4-31
4.3.1.6	Basis for Design and Calculations.....	4-32
4.3.2	Geothermal Energy	4-34
4.3.3	On-Site Wind Power Generation.....	4-37
4.3.4	Hydro-Electric Energy	4-40
4.4	Additional Measures.....	4-40
4.4.1	Water Systems.....	4-41
Section 5	Evaluation of Energy Purchasing and Procurement Strategies	
5.1	Energy Deregulation	5-1
5.1.1	Alternate Third Party Electrical Energy Supplier.....	5-1
5.2	Demand Response Program.....	5-2
Section 6	Ranking of Energy Conservation and Retrofit Measures (ECRMs)	
6.1.	ECRMs	6-1
6.1.1	Lighting Systems	6-1
6.1.2	HVAC Systems	6-2
6.1.3	Alternative Energy Systems.....	6-2
6.1.4	Wind Energy	6-3

Section 7 Grants, Incentives and Funding Sources

7.1	Renewable Energy	7-1
7.1.1	Renewable Energy Certificates (NJ BPU).....	7-1
7.1.2	Clean Energy Solutions Capital Investment Loan/ Grant (NJ EDA).....	7-1
7.1.3	Renewable Energy Incentive Program (NJ BPU).....	7-1
7.1.4	Grid Connected Renewables Program (NJ BPU).....	7-1
7.1.5	Utility Financing Programs.....	7-2
7.1.6	Renewable Energy Manufacturing Incentive (NJ BPU).....	7-2
7.1.7	PSE&G Solar Loan Program	7-2
7.1.8	Environmental Infrastructure Financing Program.....	7-2
7.1.9	Clean Renewable Energy Bonds (IRS).....	7-2
7.1.10	Qualified Energy Conservation Bonds (IRS).....	7-3
7.1.11	Global Climate Change Mitigation Incentive Fund (US EDA).....	7-3
7.1.12	Private Tax-Exempt Financing	7-4
7.2	Energy Efficiency	7-4
7.2.1	Introduction	7-4
7.2.2	New Jersey Smart Start Buildings Program (NJ BPU)	7-4
7.2.3	Pay for Performance Program (NJ BPU).....	7-5
7.2.4	Direct Install (NJ BPU).....	7-5
7.2.5	Anemometer Loan Program	7-5

Appendix A Historical Data Analysis

Appendix B Statement of Energy Performance Summary Sheets

Appendix C eQuest Model Results

Appendix D Lighting Spreadsheet

Appendix E Solar Energy Financing Worksheet

Appendix F New Jersey Smart Start Incentive Worksheets

Appendix G Facility Data Forms

Appendix H Engineers Opinion of Probable Construction Costs

Appendix I ECRM Financial Analysis

Appendix J Wind Cad Modeling

Appendix K Wind Energy Financing Worksheet

Appendix L Glacial Energy – Alternative Electric Supplier Quote

Appendix M Water Fixture Inventory

Executive Summary

As part of an initiative to reduce energy cost and consumption, the Borough of Westwood has secured the services of Camp Dresser and McKee (CDM) to perform an energy audit for four (4) facilities which are owned and operated by the Borough in an effort to develop comprehensive Energy Conservation and Retrofit Measures (ECRMs). It should be noted that the DPW Garage facility included two separate buildings. The audit therefore included a total of five (5) buildings.

CDM's energy audit team visited the facilities February 3, 2010. As a result of the site visit and evaluation of the historical energy usage of the facilities, CDM was successful in identifying opportunities for energy savings measures.

CDM has also evaluated the potential for renewable energy technologies to be implemented at the Borough's facilities to offset the electrical energy usage. Specifically, the use of solar electric photovoltaic panels, ground source heat pumps and wind turbines were investigated.

Potential energy cost savings may be available for the Borough through the use of a third party electric or gas supplier. Additionally, there is potential for the Borough to make money by participation in a Demand Response Program, as discussed in Section 5.2.

Not all ECRMs identified as a result of the energy audit are recommended. ECRMs must be economically feasible to be recommended to the Borough for implementation. The feasibility of each ECRM was measured through a simple payback analysis. The simple payback period was determined after establishing Engineer's Opinion of Probable Construction Cost estimates, O&M estimates, projected annual energy savings estimates, and the potential value of New Jersey Clean Energy rebates, or Renewable Energy Credits, if applicable. ECRMs with a payback period of 20 years or less can be recommended.

Historical Energy Usage

The following table, Table ES-1, summarizes the historical energy usage at each of the Borough's facilities as presented in Section 3. The data in Table ES-1 has been taken from the facility data forms, provided by the Borough. These values can serve as a bench-marking tool, along with the building profiles that have been established through the EPA's Portfolio Manager Program, to quantify the reduction in electrical energy and natural gas usage following the implementation of the recommended ECRMs.

Table ES-1: Summary of Annual Energy Usage & Cost						
	Electrical Energy Use (kWh)	Peak Summer Demand (kW)	Peak Winter Demand (kW)	Fuel Use for Entire Building (therms)	Cost for Electric Service	Cost for Fuel
Borough Hall	357,920	128	56	9,561	\$55,739	\$12,325
Public Library	126,090	61.8	37.5	5,474	\$23,432	\$6,284
DPW Main Building	75,768	13.7	23.2	4,655	\$11,064	\$6,077
DPW Garage	16,601	4.1	9.7	2,069	\$2,667	\$2,733
Fire Department	129,900	52.4	38.0	5,212	\$19,972	\$7,104

Recommended ECRMs

The following Table ES-2 presents the ranking of recommended ECRMs identified for the building lighting and HVAC systems based on the simple payback analysis.

Additional ECRMs associated with the building envelope and other miscellaneous appliances were identified and evaluated, as discussed in Sections 2 and 4; however, were not recommended due to longer payback periods. This table includes the Engineer's Opinion of Probable Construction Cost, projected annual energy cost savings, projected annual energy usage savings, and total simple payback period for each recommended ECRM. The ECRMs are ranked based on payback period.

Table ES-2 ¹ Ranking of Energy Savings Measures Summary					
Overall Ranking (Based on Simple Payback)	ECRM	Total Cost	Energy Savings	Annual Fiscal Savings ²	Simple Payback (Years)
1	Public Library Lighting Upgrades	\$30,271	54,784 kWh	\$5,336	5.7
2	DPW Main Building Lighting Upgrades	\$17,637	24,436 kWh	\$2,813	6.3
3	Borough Hall Direct Digital Control BMS	\$25,685	975 Therms 8,452 kWh	\$2,737	9.4
4	Borough Hall Lighting Upgrades	\$88,962	15,623 kWh	\$9,456	9.4
5	DPW Garage Lighting Upgrades	\$4,355	1,678 kWh	\$431	10.1

Table ES-2 ¹ Ranking of Energy Savings Measures Summary					
Overall Ranking (Based on Simple Payback)	ECRM	Total Cost	Energy Savings	Annual Fiscal Savings ²	Simple Payback (Years)
6	Public Library Boiler Upgrade	\$30,570	1,100 Therms	\$2,853	10.7
7	Fire Department Lighting Upgrades	\$19,774	10,770 kWh	\$1,767	11.2
8	Borough Hall Boiler Upgrade	\$65,628	2,608 Therms	\$5,464	12.0
9	Public Library Direct Digital Control BMS	\$13,800	296 Therms 2,503 kWh	\$826	16.7

1. Engineers Probable Construction Cost takes into account any applicable rebates.
2. Annual Fiscal Savings takes into account additional O&M cost or savings associated with the measure.

Renewable Energy Technologies

Solar Energy

Section 4 of the report provides for an economic evaluation of a solar energy system recommended to be installed at several of the Borough's facilities. The evaluation covered the economic feasibility of the Borough installing a solar energy system under a typical construction contract and to assume full responsibility of the operation of such a system.

Based on a simple payback model, summarized in Table ES-3, it would benefit the Borough to further investigate the installation of a solar energy system at three (3) buildings. This is primarily based on the initial upfront capital investment required for a solar energy system installation and the 14.8 year payback period. This payback period may justify installing the solar energy system. Other options such as Power Purchase Agreements are potentially available as well to help finance the project. Solar technology is constantly changing and will most likely continue to lower in price.

Two major factors influencing the project financial evaluation is the variance of the prevailing energy market conditions and Solar Renewable Energy Credit (SREC) rates, with the largest impact to the payback model being the SREC credit pricing. For the payback model, conservative estimates of the SREC's market value over a 25 year period were assumed, as discussed in Section 4.

Table ES-3 includes a simple payback analysis for the installation of a solar energy system at the identified Borough buildings.

Table ES-3: Simple Payback Analysis for Solar Energy Systems

Parameter	Solar
Estimated Budgetary Project Cost	\$1,568,850
1 st Year Production	127,525 kWh
Annual Electric Savings	\$19,654.8
Annual Estimated SREC Revenue	\$86,080
Project Simple Payback	14.8

Wind Power Generation

Section 4.3.2 of the report provides for an economic evaluation of a wind turbine energy system recommended to be installed DPW grounds. The evaluation covered the economic feasibility of furnishing and installing a wind turbine energy system under a typical construction contract and to assume full responsibility of the operation of such a system.

CDM completed a preliminary desktop wind power production analysis and has concluded that an additional on-site feasibility study is warranted and recommended. Such a feasibility study would include the installation of a wind test rig to measure actual wind conditions as observed on-site.

Wind power as a renewable energy source also qualifies for Renewable Energy Certificates (REC's). The prevailing energy market, Renewable Energy Incentive Program (REIP) and REC's comprise the major factors influencing a wind turbine energy system installation. Other options, such as government bonds or a Power Purchase Agreement are potentially available and can assist with the financing of this project.

Table ES-4 includes a typical simple payback analysis for the installation of a wind turbine energy system located in the Borough. Refer to Appendix K for a more detailed wind energy financing spreadsheet.

Table ES-4: Ranking of Energy Savings Measures Summary – Wind Turbine Energy System			
Parameter	Wind Turbine (Minimum Site Wind Speed – 8.5 mph)	Wind Turbine (Maximum Site Wind Speed – 12.4 mph)	Wind Turbine (Average Site Wind Speed – 10.6 mph)
Engineer's Opinion of Probable Cost	\$68,489.69	\$68,489.69	\$68,489.69
Renewable Energy Incentive Program **	-\$18,256	-\$51,297	-\$34,083
Total Cost	\$50,233.69	\$17,192.69	\$34,406.69
1 st Year Production	5,705 kWh	16,194 kWh	10,651 kWh
Annual Estimated Electric Savings	\$846.10	\$2,401.60	\$1,579.5
Annual Estimated REC Revenue	\$143.00	\$405.00	\$266
Project Simple Payback	50.8 Years	6.1 Years	18.6 Years

** REIP incentive is calculated for only the first year and is applied as a deduction.

Recommended ECRMs

Table ES-5 summarizes the Total Engineer's Opinion of Probable Construction Cost, annual energy savings, projected annual energy and O&M cost savings and the payback period based on the implementation of all of the above recommended ECRMs.

Table ES-5: Recommended ECRM's¹			
Total Engineer's Opinion of Probable Construction Cost	Projected Annual Energy Savings (kWh or therms)	Projected Annual Fiscal Savings	Simple Payback Period (years)
\$296,682	4,979 Therms 118,246 kWh	\$31,683	9.4

- Does not include energy savings associated with Solar Energy System or Wind Power Generation.

Section 1

Introduction

1.1 General

As part of an initiative to reduce energy cost and consumption, the Borough of Westwood, NJ has secured the services of Camp Dresser and McKee (CDM) to perform an energy audit at four (4) facilities in an effort to develop comprehensive energy conservation initiatives.

The performance of an Energy Audit requires a coordinated phased approach to identify, evaluate and recommend energy conservation and retrofit measures (ECRM). The various phases conducted under this Energy Audit included the following:

- Gather preliminary data on all facilities;
- Facility inspection;
- Identify and evaluate potential ECRMs and evaluate renewable/distributed energy measures;
- Develop the energy audit report.

Figure 1-1 is a schematic representation of the phases utilized by CDM to prepare the Energy Audit Report.

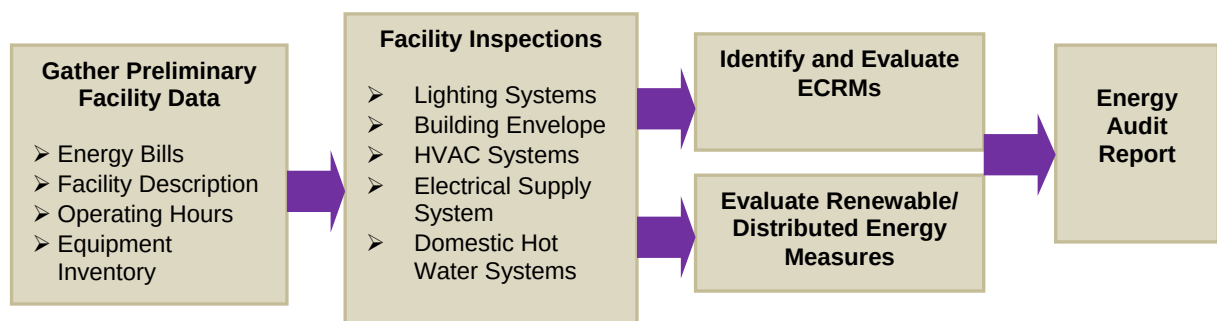


Figure 1-1: Energy Audit Phases

1.2 Background

The facilities that were included in the energy audit for the Borough of Westwood were the Borough Hall, Public Library, DPW Garage, and Fire Department.

The Borough Hall was constructed in 1994 and is approximately 29,780 square feet. It is normally occupied during typical business hours (8 AM – 5 PM) Monday through Friday by approximately 26 employees. Additionally, the police station dispatch room is occupied by at least one employee 24 hours a day, seven days per week. The police station has 26 additional employees, divided into four squads which work in 12 hour shifts.

The Public Library was originally constructed in 1939, remodeled in 1994, and is approximately 16,000 square feet. The Library is open Monday, Tuesday and Thursday from 10 AM to 9 PM; Wednesday and Friday from 10 AM to 5 PM; Saturday from 10 AM to 4 PM ; and Sunday from 1 PM to 5 PM. There are 7 employees in this building.

The DPW facility main building was constructed in 1922 and the garage was added in 1996. Together, the buildings total approximately 14,100 square feet. The buildings are primarily occupied Monday through Friday during normal business hours. There are 11 DPW employees, but only a few of them are occupying the DPW buildings at any given time, as the majority of their workload is in the field.

The Fire Department was constructed in 2004 and is 14,552 square feet. There is one full time employee who sporadically occupies the building between inspections during normal business hours, Monday through Friday.

1.3 Purpose and Scope

The objective of the energy audit is to identify energy conservation and retrofit measures to reduce energy usage and to develop an economic basis to financially validate the planning and implementation of identified energy conservation and retrofit measures.

Significant energy savings may be available with retrofits to the heating and cooling systems and lighting systems. It should be noted that the magnitude of energy savings available is not only dependent on the type of heating, lighting or insulation systems in use, but also on the age and condition of the equipment and the capital available to implement major changes. Due to the rising cost of power and the desire to minimize dependence on foreign oil supplies, energy consumption is taking a higher priority across the nation and feasible alternatives for reducing energy consumption and operating costs must be evaluated on a case-by-case basis.

The purpose of this energy audit is to identify the various critical building comfort systems that are major consumers of electrical energy and are clear candidates for energy savings measures. In addition, potential energy producing systems such as solar electric, ground source heat pumps, and wind energy systems were also evaluated. A discussion on these technologies is included in Section 4 Energy Conservation and Retrofit Measures (ECRM).

In addition to identifying ECRMs and the potential for on-site energy generation, there is potential for further energy cost savings through the use of a third party energy supplier and participation in a Demand Response Program. This is discussed further in Section 5.

Section 2

Facility Description

2.1 Borough Hall

2.1.1 Description of Building Envelope

The energy audit included an evaluation of the building's envelope (exterior shell) to determine the components' effective R-values to be utilized in the building model and to locate and fix any thermal weaknesses that may be present. The components of a building envelope include the exterior walls, foundation and roof. The construction and material, age and general condition of these components, including exterior windows and doors, impact the building's energy use.

The exterior walls of the Borough Hall are of concrete masonry unit (CMU) construction with a brick exterior and wooden stud interior with a dry wall finish. The existing roof is pitched with a wooden truss frame, plywood sheathing and asphalt shingles. The roof is insulated with fiberglass batting and appears to be in good shape.

At the center of the roof, there is a large cupola which showed signs of significant leakage around the edge. CDM strongly recommends resealing around this cupola to avoid further water damage to the surrounding structure, and minimize infiltration and consequent heat loss.

Also of concern is the existing fire sprinkler system. It was noted by personnel that there have been several pipe bursts within the small closet dormers on the upstairs level. Insulating and heat tracing the fire sprinkler pipe system, especially runs that are in close proximity to the exterior walls, is strongly recommended. This will reduce the chances of future pipe bursts, avoiding costly potential water damage.

The windows throughout the building were found to be double pane, and in good condition.

Overall it was determined that the building envelope is in good condition and is currently providing a high level of insulation. While some minor changes are strongly recommended, modifications to the insulation system would not prove to be cost-effective, from an energy savings stand-point.

2.1.2 Description of Building HVAC

Heating in the Borough Hall is primarily provided by a hot water system. A gas-fired Slant Fin cast iron hot water boiler with an input-rated capacity of 900 MBH (1 MBH = 1,000 BTU/Hr) generates hot water which is then distributed to air handling units, providing warm air to the individual occupied spaces.

Cooling is provided to the entire building through the use of air cooled condensing units. Several of these units are located outside around the perimeter of the building,

and interact with the indoor air handling units to reject heat from the individual occupied spaces.

CDM noted no central building management system controlling HVAC equipment.

2.1.3 Description of Building Lighting

The Borough Hall existing interior lighting system consists of 1X2 (1 and 2 lamp), 2X2 (2 and 3 lamp), 1X4 (1, 2, and 3 lamp), 2X4 (2, 3, and 4 lamp) T8 and T12 linear fluorescent fixtures with magnetic ballasts, compact fluorescent, incandescent, and high intensity discharge (HID) fixtures. The building has occupancy controls in various rooms. Existing exterior lighting consists of HID wall packs, canopy fixtures, compact fluorescent fixtures, and HID parking lot and sidewalk fixtures. Refer to Section 4 for a more detailed description.

2.2 Public Library

2.2.1 Description of Building Envelope

The exterior walls of the Public Library are of CMU construction with a brick exterior and wooden stud interior with a dry wall finish. The existing roof is pitched with a wooden truss frame, plywood sheathing and asphalt shingles. The roof is insulated with fiberglass batting and appears to be in good shape.

Significant cracking was noted at the bottom of the large bay window in the front of the building. CDM recommends caulking cracks such as this to reduce unnecessary infiltration and resulting heat loss within the building.

The majority of the windows throughout the building were found to be double pane, and in good condition.



Overall it was determined that the building envelope is in good condition and is currently providing a high level of insulation. While some minor changes are strongly recommended, modifications to the insulation system would not prove to be cost effective, from an energy savings standpoint.

2.2.2 Description of Building HVAC

Heating in the Library is primarily provided by a hot water system. A gas-fired HB Smith cast iron steam boiler generates 710 lbs/hr of steam which then interacts with a steam-to-hot water heat exchanger to provide space heating for the building. The hot water is delivered to hot water coils found in air handling units in the attic and basement mechanical room. At one time, heat was entirely provided by steam to radiators throughout the building. As the steam system was taken offline in favor of a

hot water system, areas that were heated solely by steam radiators, such as stairwells, are now unheated. Heat is supplemented in drafty or chilly spots, such as the main entrance foyer and front reading area by electric resistance heat, in the form of baseboards and fan coils.

The air handling units in the attic and basement interact with roof-mounted air cooled condensing units to provide cooling to all main occupied areas of the building.

HVAC units in this building are currently controlled by an outside company. Library personnel are interested in implementing a building management system which is controlled in-house.

2.2.3 Description of Building Lighting

The Public Library existing interior lighting system consists of 1X4 (1 and 2 lamp), 2X4 (2, 3, and 4 lamp) T8 and T12 linear fluorescent fixtures with electronic and magnetic ballasts, compact fluorescent, and incandescent fixtures. Existing exterior lighting consists of compact fluorescent, halogen incandescent, and HID parking lot fixtures. Refer to Section 4 for a more detailed description.

2.3 DPW Main Building

2.3.1 Description of Building Envelope

The exterior walls of the DPW main building are of CMU construction. The existing roof is part pitched and part flat with a wooden truss frame, plywood sheathing and asphalt shingles. The roof is insulated with fiberglass batting and appears to be in good shape.

CDM noted a hole in the wall of the building that was found in a storage room in the upstairs attic area of the building. Covering or repairing this wall is strongly recommended as it will reduce unnecessary infiltration and resulting heat loss within the building.

There were a few window air conditioning units in place at the time of the audit. It is recommended that the air conditioning sleeves be checked for a tight seal and as the units are left in place through winter that AC covers be purchased and installed. An outdoor AC cover, covers the top and sides of the unit to stop drafts. Window and though-wall AC covers are UV resistant, water repellent PVC vinyl with elasticized corners and straps for a tight fit. Outdoor or indoor AC covers can also be customized. A standard outdoor AC cover can cost around \$15. The impact of the



Example of an Outdoor AC Cover

overall building heating load will be minimal; however, there will be a direct impact on the occupants' comfort.

Overall it was determined that the building envelope is in good condition and is currently providing a high level of insulation. While some minor changes are strongly recommended, modifications to the insulation system would not prove to be cost effective, from an energy savings stand-point.

2.3.2 Description of Building HVAC

Heating in the main building is primarily provided by gas-fired unit heaters. Four ceiling-mounted Reznor units were found in or near the four corners of the building. In the upstairs office area, heating is provided by electric baseboard units.

Cooling is provided in office and break areas by window air conditioning units.

2.3.3 Description of Building Lighting

The DPW Main Building existing interior lighting system consists of 1X4 (1 and 2 lamp), 1X8 (2 and 4 lamp), 2X4 (4 lamp) T8 and T12 linear fluorescent fixtures with electronic and magnetic ballasts, circular fluorescent, and a metal halide fixture. Existing exterior lighting consists of halogen incandescent, HID wallpacks, and HID parking lot fixtures. Refer to Section 4 for a more detailed description.

2.4 DPW Garage

2.4.1 Description of Building Envelope

The exterior walls of the DPW garage consist of metal cladding with an insulated, finished interior. The existing roof is pitched with a wooden truss frame, plywood sheathing and asphalt shingles. The roof is insulated with fiberglass batting and appears to be in good shape.

Overall it was determined that the building envelope is in good condition and is currently providing a high level of insulation. Modifications to the insulation system would not prove to be cost effective, from an energy savings stand-point.

2.4.2 Description of Building HVAC

Heating in the garage building is entirely provided by ceiling-mounted gas-fired radiant tube heaters. Five Roberts Gordon heaters were located throughout the garage.

No cooling was noted in this building.

2.4.3 Description of Building Lighting

The DPW Main Building existing interior lighting system consists of 1X8 (2 lamp) T12 linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Lighting visibility within the garage area is significantly low and is later addressed in Section 4

of this report. Existing exterior lighting consists of halogen incandescent fixtures, and HID wallpacks. Refer to Section 4 for a more detailed description.

2.5 Fire Department

2.5.1 Description of Building Envelope

The exterior walls of the Fire Department are of CMU construction with a brick exterior. The existing roof consists mainly of a flat steel roof deck with a steel frame. The roof is insulated with fiberglass batting and appears to be in good shape.

The windows throughout the building were found to be double pane, and in good condition. The overhead doors are insulated and also appear to be in good condition.

Overall it was determined that the building envelope is in good condition and is currently providing a high level of insulation. Modifications to the insulation system would not prove to be cost effective, from an energy savings stand-point.

2.5.2 Description of Building HVAC

The large truck bay in the Fire Department building is heated by gas-fired Re-Verber - Ray radiant tube heaters. The remaining occupied areas of the building are heated by York gas-fired rooftop air conditioning units.

The York rooftop units are packaged with direct expansion (DX) cooling coils and condensers to provide cooling to the occupied areas of the building. No cooling was noted in the truck bay area.

Seven-day programmable thermostats were noted in the occupied spaces of the building.

2.5.3 Description of Building Lighting

The Fire Department existing interior lighting system consists of 2X2 (3 lamp), 1X4 (1 and 2 lamp), 2X4 (3 lamp) T8 linear fluorescent fixtures with electronic ballasts, compact fluorescent, halogen incandescent, and high intensity discharge (HID) fixtures. An extensive quantity of occupancy controls is also present in the building. Existing exterior lighting consists of HID wall packs, canopy fixtures, and HID parking lot and garage fixtures. Refer to Section 4 for a more detailed description.

Section 3

Baseline Energy Use

3.1 Utility Data Analysis

The first step in the energy audit process is the compilation and quantification of the facility's current and historical energy usage and associated utility costs. It is important to establish the existing patterns of electricity, gas, and oil usage in order to be able to identify areas in which energy consumption can be reduced.

For this study, the monthly gas and electric bills per facility were analyzed and unit costs of energy were obtained. The unit cost of energy, as determined from the information provided by the Borough, was utilized in determining the feasibility of switching from one energy source to another or reducing the demand on that particular source of energy to create annual cost savings for the Borough.

3.1.1 Electric Charges

It is also important to understand how the utilities charge for the service. The majority of the energy consumed is electric as a result of both indoor and outdoor lighting and appliances, such as kitchen appliances, computers, printers and projectors. Electricity is charged by three basic components: electrical consumption (kWh), electrical demand (kW) and power factor (kVAR) (reactive power). The cost for electrical consumption is similar to the cost for fuel and the monthly consumption appears on the utility bill as kWh consumed per month with a cost figure associated with it. The service connections are either billed on a flat rate or time of day rates per kWh.

Electrical demand can be as much as 50 percent or more of the electric bill. The maximum demand (kW value) during the billing period is multiplied by the demand cost factor and the result is added to the electric bill. It is often possible to decrease the electric bill by 15 – 25 percent by reducing the demand, while still using the same amount of energy.

The power factor (reactive power) is the power required to energize electric and magnetic fields that result in the production of real power. Power factor is important because transmission and distribution systems must be designed and built to manage the need for real power, as well as the reactive power component (the total power). If the power factor is low, then the total power required can be greater than 50 percent or more than the real power alone. The power factor charge is a penalty for having a low power factor. Fortunately, this penalty charge does not impact the Borough.

The other parts of the electric bill are the supply charges, delivery charges, system benefits, transmission revenue adjustments, state and municipality tariff surcharges and sales taxes, which cannot be avoided.

Public Service Electric & Gas (PSE&G) is the current supplier and distributor of electric energy for the Borough.

3.1.2 Natural Gas Charges

PSE&G is the current supplier and distributor of natural gas for the Borough. The Borough is charged for the cost of the natural gas, a delivery charge and a customer charge, which covers gas administration charges.

3.2 Facility Results

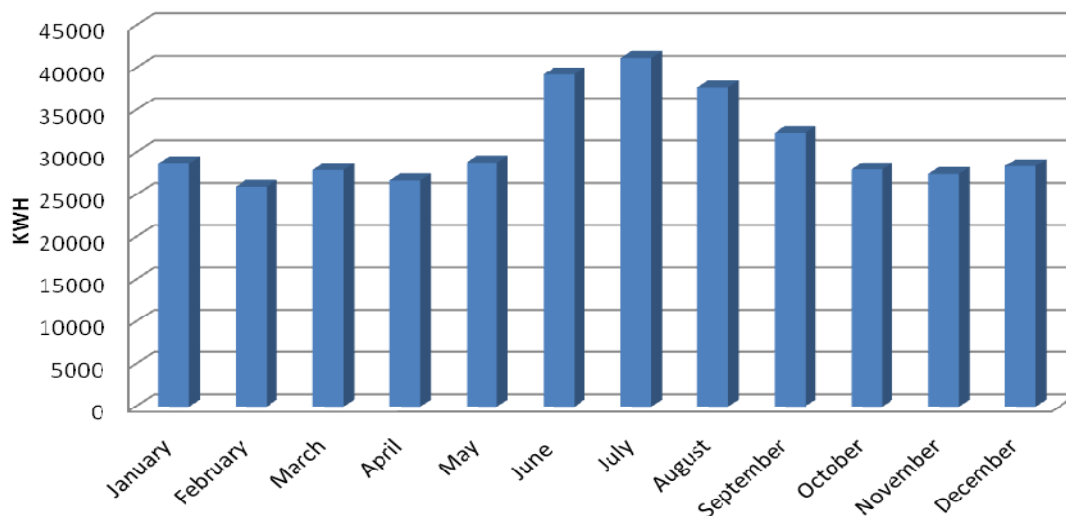
3.2.1 Borough Hall

Electric power for the Borough Hall is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-1 illustrates the average monthly total energy consumption from January 2008 through March 2009. For example, for the month of February, the bar graph represents average energy consumption for February 2008 and 2009. This same graphical representation approach has been carried through for all months and is typical for all graphs presented in this Section. Electrical usage has been averaged by month for the above referenced time period to portray a more encompassing monthly usage trend.

From this graph, it can be determined that the baseline electrical consumption for the Borough Hall is approximately, 23,000kWh/month.

Table 3.2-1 illustrates the seasonal peak demand loads for the Borough Hall from January 2008 through March 2009. The information present is only as recent as the most recent bill received.

Figure 3.2-1: Borough Hall



The most recent tariff rates available at the time of this audit for the Borough Hall's electrical service, from PSE&G are as follows:

		Acct #: 41 815 006 08
Service Charge:		\$4.24/month
Delivery Service Charges:		\$0.008416522/kWh
		\$3.894107142/kW
Societal Benefits Charge:		\$0.007507785/kWh
Securitization Transition:		\$0.010353806/kWh
Supply Service Charges:	Generation:	\$4.664296172/kW
	Transmission:	\$1.658281389/kW
	Charge:	\$0.093369377/kWh

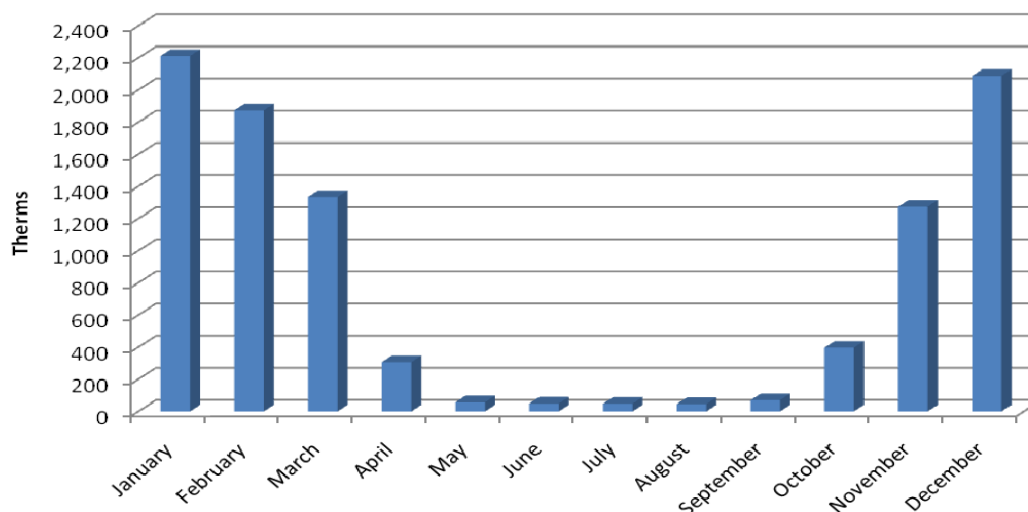
Table 3.2-1: Borough Hall's Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	127
Winter	62

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-2 illustrates the Borough Hall's monthly average natural gas consumption from January 2008 through March 2009.

Figure 3.2-2 Borough Hall's Gas Usage



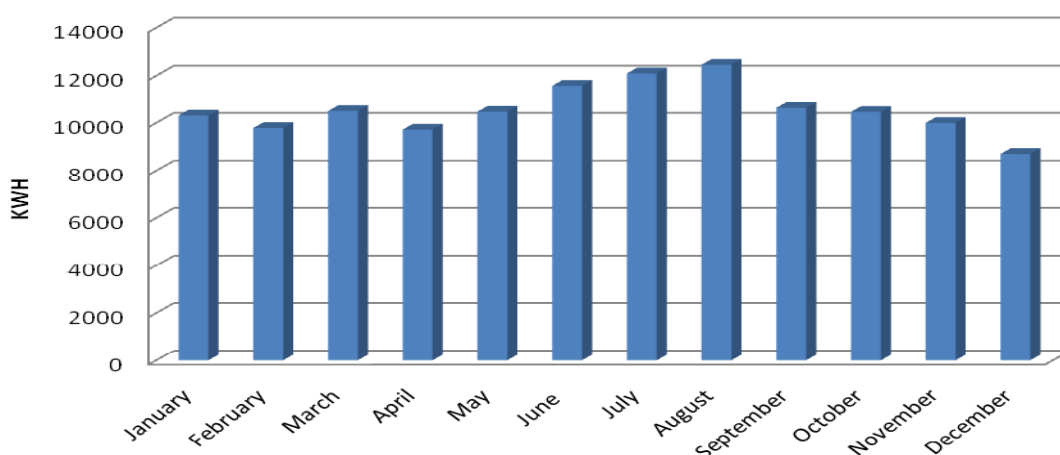
3.2.2 Public Library

Electric power for the Public Library is fed from one General Secondary Service three phase line from PSE&G. Figure 3.2-3 illustrates the average monthly total energy consumption from January 2008 through December 2009.

From this graph, it can be determined that the baseline electrical consumption for the Public Library is approximately 9,000 kWh/month.

Table 3.2-2 illustrates the seasonal peak demand loads for the Public Library from January 2008 through December 2009.

Figure 3.2-3: Public Library



The most recent tariff rates available at the time of this audit for the Public Library's electrical service, from PSE&G are as follows:

		Acct #: 65 241 997 07
Service Charge:		\$4.27/month
Delivery Service Charges:		\$0.008989680/kWh
		\$3.920266667/kW
Societal Benefits Charge:		\$0.007567595/kWh
Securitization Transition:		\$0.010353973/kWh
Supply Service Charges:	Generation:	\$5.123255392/kW
	Transmission:	\$1.673747164/kW
	Charge:	\$0.089474104/kWh

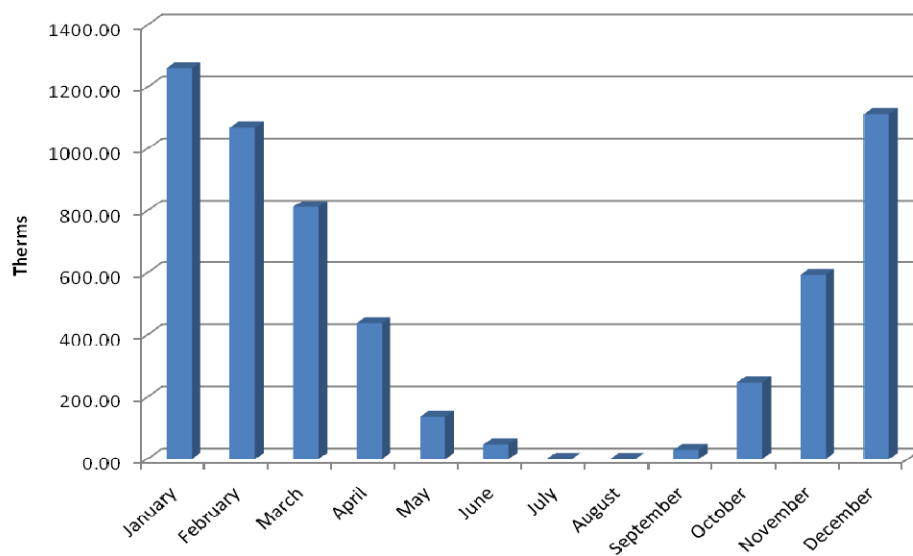
Table 3.2-2: Public Library's Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	63
Winter	39

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-4 illustrates the Public Library's monthly average natural gas consumption from January 2008 through December 2009.

Figure 3.2-4: Public Library's Gas Usage



For more on the Public Library's gas usage, refer to Section 4.2.

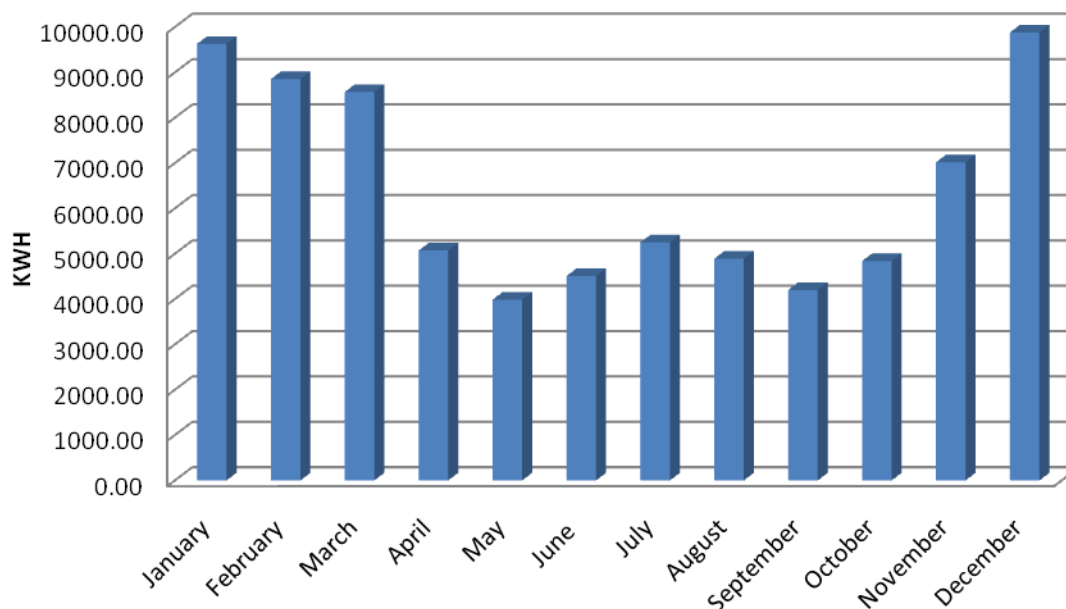
3.2.3 DPW Main Building

Electric power for the DPW Main Building is fed from one General Secondary Service single phase line from PSE&G. Figure 3.2-5 illustrates the average monthly total energy consumption from January 2008 through March 2009.

From this graph, it can be determined that the baseline electrical consumption for the DPW Main Building is approximately 3,900 kWh/month.

Table 3.2-3 illustrates the seasonal peak demand loads for the DPW Main Building from January 2008 through March 2009.

Figure 3.2-5: DPW Main Building



The most recent tariff rates available at the time of this audit for the DPW Main Building's electrical service, from PSE&G are as follows:

		Acct #: 41 774 164 01
Service Charge:		\$4.24/month
Delivery Service Charges:		\$0.008418042/kWh
		\$3.893965517/kW
Societal Benefits Charge:		\$0.007508250/kWh
Securitization Transition:		\$0.010353135/kWh
Supply Service Charges:	Generation:	\$4.664437012/kW
	Transmission:	\$1.658204895/kW
	Charge:	\$0.093544554/kWh

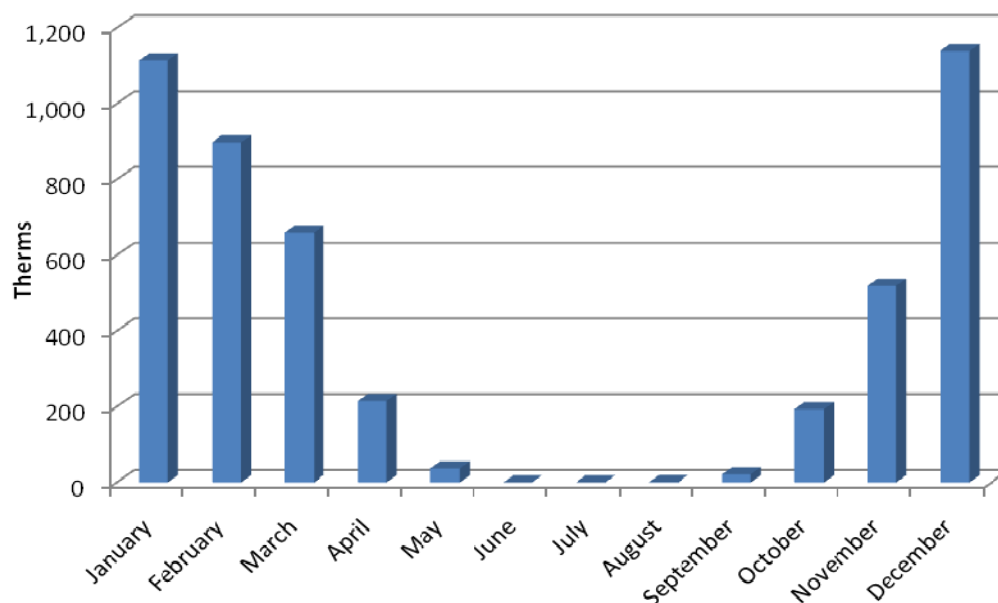
Table 3.2-3: DPW Main Building's Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	14
Winter	22

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-6 illustrates the DPW Main Building's monthly average natural gas consumption from January 2008 through March 2009.

Figure 3.2-6: DPW Main Building's Gas Usage



For more on the DPW Main Building's gas usage, refer to Section 4.2.

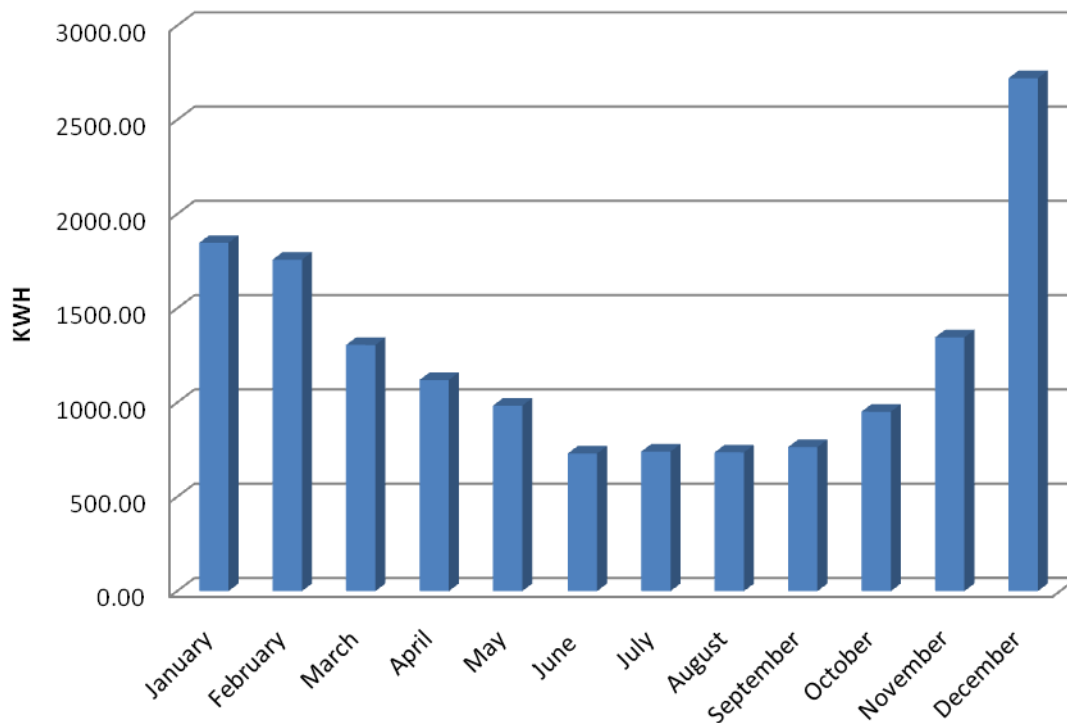
3.2.4 DPW Garage

Electric power for the DPW Garage is fed from one General Secondary Service single phase line from PSE&G. Figure 3.2-7 illustrates the average monthly total energy consumption from January 2008 through March 2009.

From this graph, it can be determined that the baseline electrical consumption for the DPW Garage is approximately 730 kWh/month.

Table 3.2-4 illustrates the seasonal peak demand loads for the DPW Garage from January 2008 through March 2009.

Figure 3.2-7: DPW Garage



The most recent tariff rates available at the time of this audit for the DPW Garage's electrical service, from PSE&G are as follows:

Acct #: 41 774 161 18		
Service Charge:		\$4.24/month
Delivery Service Charges:		\$0.008417085/kWh
		\$3.893650793/kW
Societal Benefits Charge:		\$0.007507537/kWh
Securitization Transition:		\$0.010351758/kWh
Supply Service Charges:	Generation:	\$4.663716814/kW
	Transmission:	\$1.658192090/kW
	Charge:	\$0.093547739/kWh

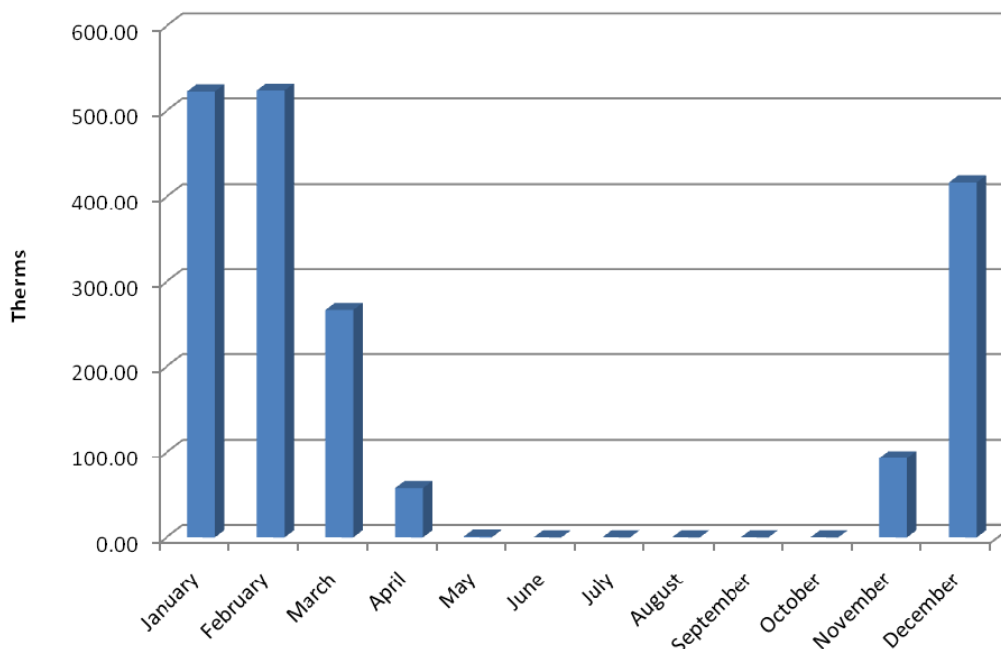
Table 3.2-4: DPW Garage's Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	4
Winter	8

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-8 illustrates the DPW Garage's monthly average natural gas consumption from January 2008 through March 2009.

Figure 3.2-8: DPW Garage's Gas Usage



For more on the DPW Garage's gas usage, refer to Section 4.2.

3.2.5 Fire Department

Electric power for the Fire Department is fed from one General Secondary Service three phase line from PSE&G. Figure 3.2-9 illustrates the average monthly total energy consumption from January 2009 through December 2009.

From this graph, it can be determined that the baseline electrical consumption for the Fire Department is approximately 8,500 kWh/month.

Table 3.2-5 illustrates the seasonal peak demand loads for the Fire Department from January 2008 through March 2009.

The most recent tariff rates available at the time of this audit for the Fire Department's electrical service, from PSE&G are as follows:

		Acct #: 41 816 039 03
Service Charge:		\$4.24/month
Delivery Service Charges:		\$0.008416667/kWh
		\$3.8940787947/kW
Societal Benefits Charge:		\$0.007508215/kWh
Securitization Transition:		\$0.010354460/kWh
Supply Service Charges:	Generation:	\$4.664192949/kW
	Transmission:	\$1.658358805/kW
	Charge:	\$0.093368545/kWh

Figure 3.2-9: Fire Department

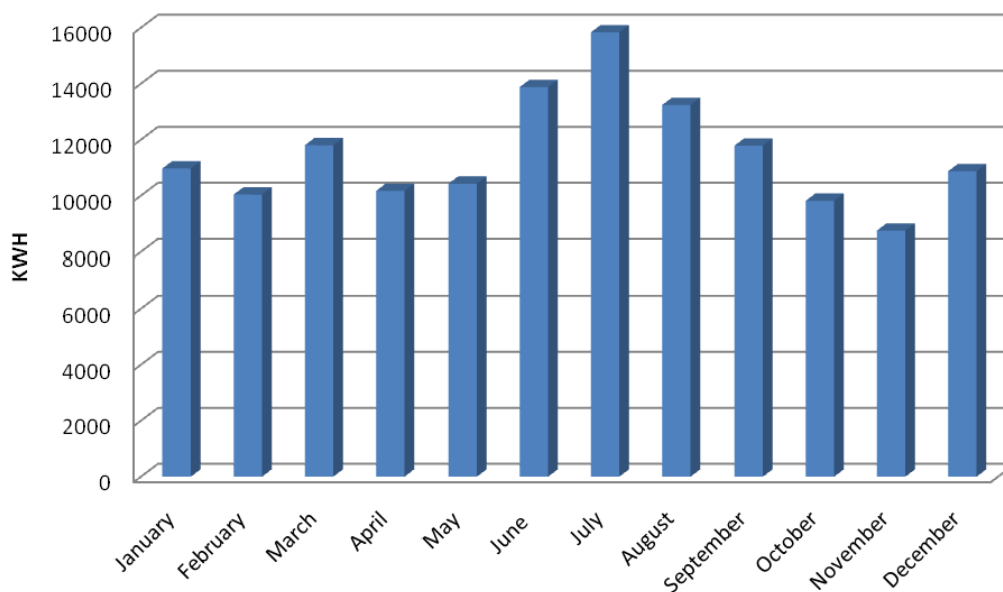


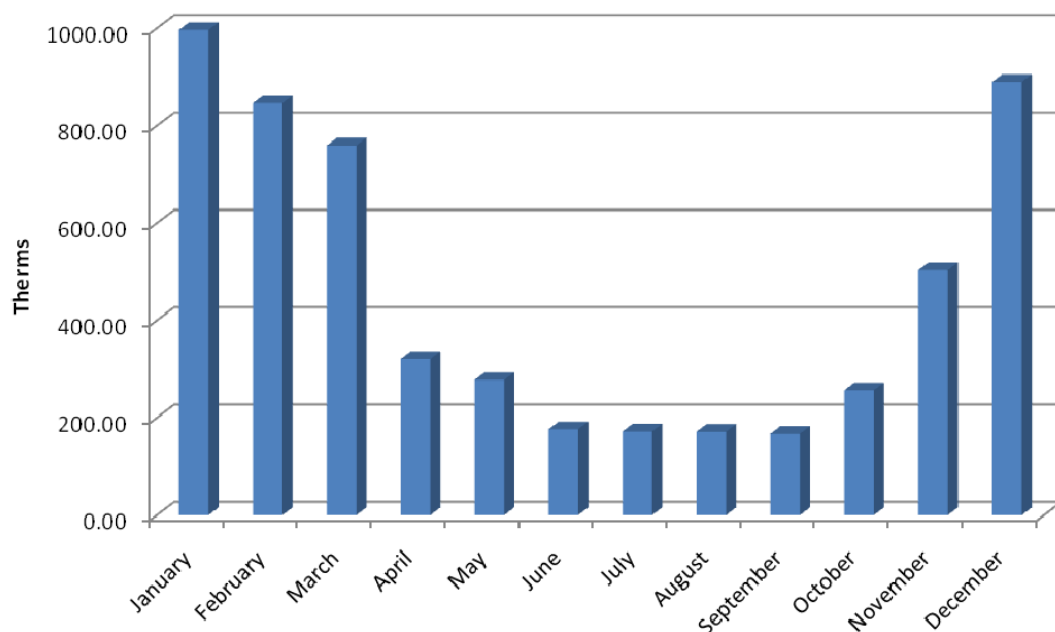
Table 3.2-5: Fire Department's Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	54
Winter	41

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-10 illustrates the Fire Department's monthly average natural gas consumption from January 2008 through March 2009.

Figure 3.2-10: Fire Department's Gas Usage



For more on the Fire Department's gas usage, refer to Section 4.2.

3.3 Aggregate Costs

For the purposes of computing energy savings for all identified energy conservation and retrofit measures, aggregate unit costs for electrical energy and fuel, in terms of cost/kWH and cost/therm, were determined for each service location and utilized in the simple payback analyses discussed in subsequent sections. The aggregate unit cost accounts for all distribution and supply charges for each location. Table 3.3-1 and

Table 3.3-2 summarize the aggregate costs for electrical energy consumption and therms utilized, respectively.

Table 3.3-1: Electrical Aggregate Unit Costs

Service Location	Aggregate \$ / kW-hr
Borough Hall	\$0.1485
Public Library	\$0.1846
DPW Main Building	\$0.1483
DPW Garage	\$0.1746
Fire Department	\$0.1478

Table 3.3-2: Natural Gas Aggregate Unit Costs

Service Location	Aggregate \$ / therm
Borough Hall	\$1.52
Public Library	\$1.23
DPW Main Building	\$1.44
DPW Garage	\$1.41
Fire Department	\$1.48

3.4 Portfolio Manager

3.4.1 Portfolio Manager Overview

Portfolio Manager is an interactive energy management tool that allows the Borough to track and assess energy consumption at the facilities in a secure online environment. Portfolio Manager can help the Borough set investment priorities, verify efficiency improvements, and receive EPA recognition for superior energy performance.

3.4.2 Energy Performance Rating

For many facilities, you can rate their energy performance on a scale of 1–100 relative to similar facilities nationwide. Your facility is *not* compared to the other facilities entered into Portfolio Manager to determine your ENERGY STAR rating. Instead, statistically representative models are used to compare your facility against similar

facilities from a national survey conducted by the Department of Energy's Energy Information Administration. This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), is conducted every four years, and gathers data on building characteristics and energy use from thousands of facilities across the United States. Your facility's peer group of comparison is those facilities in the CBECS survey that have similar facility and operating characteristics. A rating of 50 indicates that the facility, from an energy consumption standpoint, performs better than 50% of all similar facilities nationwide, while a rating of 75 indicates that the facility performs better than 75% of all similar facilities nationwide.

3.4.3 Portfolio Manager Account Information

A Portfolio Manager account has been established for the Borough, which includes a profile for the five (5) buildings. Information entered into this Portfolio Manager Facility profile, including electrical energy consumption and natural gas consumption has been used to establish a performance baseline.

It is recommended that the information be updated to track the buildings' energy usage. None of the five (5) buildings were eligible for an energy star label. Ratings were given for one (1) of the five (5) buildings. Of the five (5) buildings, four (4) were of a building type that is not supported by the Energy Star program found in Portfolio Manager. Results are a reflection of the information supplied, if more recent information is entered into the Portfolio Manager account, there is a possibility for better results.

It is recommended that the information be updated to track the buildings' energy usage. At the time of the audit, the Borough Hall received a rating of 65 out of a possible 100.

Appendix B contains the Statements of Energy Performance for each building and a Portfolio Manager Reference Sheet.

The following website link, username and password shall be used to access the Portfolio Manager account and building profiles that has been established for the Borough:

<https://www.energystar.gov/istar/pmpam/>

USERNAME: Westwood1

PASSWORD: EnergyStar

Section 4

Energy Conservation and Retrofit Measures (ECRM)

The following is a summary of how Annual Return on Investment (AROI), Internal Rate of Return (IRR), and Net Present Value (NPV) will be broken down in the cost analysis for all ECRMs recommended in this report.

Included in the simplified payback analysis summary table is the 'Annual Return on Investment' (AROI) values. This value is a performance measure used to evaluate the efficiency of an investment and is calculated using the following equation:

$$AROI = \frac{AECS + OCS}{NET\ ECM\ Cost} - \frac{1}{Lifetime}$$

Where OCS = Operating Cost Savings, and AECS = Annual Energy Cost Savings.

Also included in the table are net present values for each option. The NPV calculates the present value of an investment's future cash flows based on the time value of money, which is accounted for by a discount rate (DR) (assume bond rate of 3%). NPV is calculated using the following equation:

$$NPV = \sum_{n=0}^N \frac{C_n}{(1 + DR)^n}$$

Where C_n =Annual cash flow, and N = number of years.

The Internal Rate of Return (IRR) expresses an annual rate that results in a break-even point for the investment. If the Authority is currently experiencing a lower return on their capital than the IRR, the project is financially advantageous. This measure also allows the Borough to compare ECRM's against each other to determine the most appealing choices.

$$IRR \rightarrow 0 = \sum_{n=0}^N \frac{C_n}{(1 + IRR)^n}$$

Where C_n =Annual cash flow, and N = number of years.

The lifetime energy savings represents the cumulative energy savings over the assumed life of the ECRM.

4.1 Building Lighting Systems

The goal of this section is to present any lighting energy conservation measures that may also be cost beneficial. It should be noted that replacing current bulbs with more energy-efficient equivalents will have a small effect on the building heating and cooling loads. The building cooling load will see a small decrease from an upgrade to more efficient bulbs and the heating load will see a small increase, as the more energy efficient bulbs give off less heat.

Two options are offered for most buildings. The first option will be for upgrading existing interior lighting, if applicable. The second option will be for upgrading existing exterior lighting, if applicable. A total cost for upgrading both options at the same time will be presented. Retrofitting of existing fluorescent fixtures includes upgrading both ballasts and lamps for the fixture. Refer to Appendix D for more information.

For all of the buildings, it was noted there were existing interior occupancy sensors installed. Installing occupancy sensors in rooms where there are none will typically increase energy savings; however, if the space is not occupied often in the first place, there will be little savings by installing occupancy sensors. However, certain areas of all of the five Borough buildings could benefit from installation of occupancy sensors. Therefore, occupancy sensor installation has been recommended in this report. Refer to Appendix D for occupancy sensor locations and quantities.

Please note that the Engineer's Estimate of Probable Construction Costs presented herein are estimates based on historic data compiled from similar installations and engineering opinions. Additional engineering will be required for each measure identified in this report and final scope of work and budget cost estimates will need to be confirmed prior to the coordination of project financing or the issuance of a Request for Proposal.

4.1.1 Borough Hall

It is recommended that the existing lighting system at the Borough Hall be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems. Options for improving the interior and exterior lighting for the Borough Hall are listed in Table 4.1-1.

Table 4.1-1 Borough Hall Lighting System Improvements	
Interior Lighting	High Performance T8 Retrofit, Incandescent to Compact Fluorescent
Exterior Lighting	Induction Replacement of Exterior Fixtures

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix D for a line-by-line proposed detailed lighting upgrades list.

The annual energy savings for these options are as follows:

Interior Lighting: 11.8kW, 39,003.3 kWh and \$5,792.0

Exterior Lighting: 3.6kW, 15,781.1 kWh and \$2,343.5

The following table, Table 4.1-2, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Borough Hall.

Table 4.1-2 Borough Hall Lighting System Improvements***			
	Interior Lighting	Exterior Lighting	Total
Engineer's Opinion of Probable Cost	\$73,935.66	\$20,096.25	\$94,031.91
New Jersey SmartStart Rebate	-\$3,600*	-\$1,470*	-\$5,070*
Total Cost	\$70,335.66	\$18,626.25	\$88,961.91
Annual Energy Savings	\$5,791.99	\$2,343.50	\$8,135.49
Annual Maintenance Cost Savings (AMCS)	\$1,246.83	\$73.44	\$1,320.27
Simple Payback	10.0 years	7.7 years	9.4 years
Annual Return on Investment (AROI)	3.34%	6.31%	3.96%
Lifetime Energy Savings (15 years)**	\$107,724.72	\$43,586.55	\$151,311.28
Internal Rate of Return (IRR)	8.28%	12.54%	9.22%
Net Present Value (NPV)	\$32,171.10	\$16,571.27	\$48,743.93

* Additional incentives, based on eligibility, are available through the New Jersey SmartStart Program, see Appendix F.

**3% yearly inflation on electricity costs

***See Appendix H & I for ECRM Financial Analyses

It should be noted that the Annual Energy Savings assume the annual hours per year of operation as outlined under the columns entitled "Proposed Operational Hours Without Sensors" in Appendix D.

4.1.2 Public Library

It is recommended that the existing lighting system at the Public Library be upgraded to high efficiency standards to create lighting uniformity throughout the buildings. In general, the recommended lighting upgrade, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems. Options for improving the interior and exterior lighting for the Public Library are listed in Table 4.1-3.

Table 4.1-3 Public Library Building Lighting System Improvements	
Interior Lighting	High Performance T8 Retrofit, Incandescent to Compact Fluorescent
Exterior Lighting	Induction Replacement of Exterior Fixtures, Incandescent to Compact Fluorescent

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix D for a line-by-line proposed detailed lighting upgrades list.

The annual energy savings for these options are as follows:

Interior Lighting: 6.1kW, 19,477.9 kWh and \$3,595.6

Exterior Lighting: 1.1kW, 4,958.2 kWh and \$915.3

The following table, Table 4.1-4, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Public Library Building.

Table 4.1-4 Public Library Building Lighting System Improvements***			
	Interior Lighting	Exterior Lighting	Total
Engineer's Opinion of Probable Cost	\$28,029.09	\$4,453.38	\$32,482.47
New Jersey SmartStart Rebate	-\$1,840*	-\$371*	-\$2,211*
Total Cost	\$26,189.09	\$4,082.38	\$30,271.47
Annual Energy Savings	\$3,595.62	\$915.28	\$4,510.90
Annual Maintenance Cost Savings (AMCS)	\$607.86	\$216.96	\$824.82

Simple Payback	6.2 years	3.6 years	5.7 years
Annual Return on Investment (AROI)	9.38%	21.07%	10.96%
Lifetime Energy Savings (15 years)**	\$66,874.63	\$17,023.21	\$83,897.84
Internal Rate of Return (IRR)	16.53%	29.88%	18.46%
Net Present Value (NPV)	\$35,026.92	\$12,407.41	\$47,432.87

* Additional incentives, based on eligibility, are available through the New Jersey SmartStart Program, see Appendix F.

**3% yearly inflation on electricity costs

***See Appendix H & I for ECRM Financial Analyses

It should be noted that the Annual Energy Savings assume the annual hours per year of operation as outlined under the columns entitled “Proposed Operational Hours without Sensors” and “Proposed Operational Hours with Sensors” in Appendix D.

4.1.3 DPW Main Building

It is recommended that the existing lighting system at the DPW Main Building be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems. The proposed option for improving the exterior lighting for the DPW Main Building is listed in Table 4.1-5.

Table 4.1-5 DPW Main Building Lighting System Improvements	
Interior Lighting	High Performance T8 Retrofit
Exterior Lighting	Induction Replacement of Exterior Fixtures, Incandescent to Compact Fluorescent

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix D for a line-by-line proposed detailed lighting upgrades list.

The annual energy savings for this option is as follows:

Interior Lighting: 3.1kW, 7,113 kWh and \$1,054.9

Exterior Lighting: 1.9kW, 8,510.3 kWh and \$1,262.1

The following table, Table 4.1-6, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the DPW Main Building.

Table 4.1-6 DPW Main Building Lighting System Improvements***			
	Interior Lighting	Exterior Lighting	Total
Engineer's Opinion of Probable Cost	\$12,637.78	\$6,329.31	\$18,967.09
New Jersey SmartStart Rebate	-\$770*	-\$560*	-\$1,330*
Total Cost	\$11,867.78	\$5,769.31	\$17,637.09
Annual Energy Savings	\$1,054.86	\$1,262.08	\$2,316.94
Annual Maintenance Cost Savings (AMCS)	\$207.27	\$289.08	\$496.35
Simple Payback	9.4 years	3.7 years	6.3 years
Annual Return on Investment (AROI)	3.97%	20.22%	9.28%
Lifetime Energy Savings (15 years)**	\$19,619.25	\$23,473.32	\$43,092.75
Internal Rate of Return (IRR)	9.23%	28.96%	16.41%
Net Present Value (NPV)	\$6,513.75	\$16,820.99	\$23,333.29

* Additional incentives, based on eligibility, are available through the New Jersey SmartStart Program, see Appendix F.

**3% yearly inflation on electricity costs

***See Appendix H & I for ECRM Financial Analyses

It should be noted that the Annual Energy Savings assume the annual hours per year of operation as outlined under the columns entitled "Proposed Operational Hours without Sensors" and "Proposed Operational Hours with Sensors" in Appendix D.

4.1.4 DPW Garage

It is recommended that the existing lighting system at the DPW Garage Building be upgraded to high efficiency standards to create lighting uniformity throughout the buildings. In general, the recommended lighting upgrade, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems. Options for improving the interior and exterior lighting for the DPW Garage Building are listed in Table 4.1-7.

Table 4.1-7 DPW Garage Building Lighting System Improvements	
Interior Lighting	High Performance T8 Retrofit, Incandescent to Compact Fluorescent
Exterior Lighting	Induction Retrofit of Exterior Fixtures, Incandescent to Compact Fluorescent

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix D for a line-by-line proposed detailed lighting upgrades list.

The annual energy savings for these options are as follows:

Interior Lighting: 0.4kW, 942.2 kWh and \$164.5
Exterior Lighting: 0.2kW, 735.8 kWh and \$128.5

The following table, Table 4.1-8, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the DPW Garage Building.

Table 4.1-8 DPW Garage Building Lighting System Improvements***			
	Interior Lighting	Exterior Lighting	Total
Engineer's Opinion of Probable Cost	\$3,060.44	\$1,578.38	\$4,638.82
New Jersey SmartStart Rebate	-\$270*	-\$14*	-\$284*
Total Cost	\$2,790.44	\$1,564.38	\$4,354.82
Annual Energy Savings	\$164.52	\$128.48	\$293.00
Annual Maintenance Cost Savings (AMCS)	\$89.87	\$47.74	\$137.61
Simple Payback	11.0 years	8.9 years	10.1 years
Annual Return on Investment (AROI)	2.45%	4.60%	3.22%
Lifetime Energy Savings (15 years)**	\$3,059.89	\$2,389.59	\$5,449.30
Internal Rate of Return (IRR)	6.89%	10.14%	8.10%
Net Present Value (NPV)	\$914.45	\$1,001.62	\$1,916.07

* Additional incentives, based on eligibility, are available through the New Jersey SmartStart Program, see Appendix F.

**3% yearly inflation on electricity costs

***See Appendix H & I for ECRM Financial Analyses

It should be noted that the Annual Energy Savings assume the annual hours per year of operation as outlined under the columns entitled "Proposed Operational Hours without Sensors" and "Proposed Operational Hours with Sensors" in Appendix D.

4.1.5 Fire Department

It is recommended that the existing lighting system at the Fire Department Building be upgraded to high efficiency standards to create lighting uniformity throughout the buildings. In general, the recommended lighting upgrade, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems. Options for improving the interior and exterior lighting for the Fire Department Building are listed in Table 4.1-9.

Table 4.1-9 Fire Department Building Lighting System Improvements	
Interior Lighting	Metal Halide to Fluorescent
Exterior Lighting	Induction Retrofit of Exterior Fixtures, Incandescent to Compact Fluorescent

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix D for a line-by-line proposed detailed lighting upgrades list.

The annual energy savings for these options are as follows:

Interior Lighting: 1.6kW, 5,547.5 kWh and \$819.9

Exterior Lighting: 2.5kW, 5,222.9 kWh and \$771.9

The following table, Table 4.1-10, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Fire Department Building.

Table 4.1-10 Fire Department Building Lighting System Improvements***			
	Interior Lighting	Exterior Lighting	Total
Engineer's Opinion of Probable Cost	\$11,935.56	\$9,568.00	\$21,503.56
New Jersey SmartStart Rebate	-\$1,170*	-\$560*	-\$1,730*
Total Cost	\$10,765.56	\$9,008.00	\$19,773.56
Annual Energy Savings	\$819.92	\$771.94	\$1,591.86
Annual Maintenance Cost Savings (AMCS)	\$22.60	\$152.18	\$174.78

Simple Payback	12.8 years	9.7years	11.2 years
Annual Return on Investment (AROI)	1.16%	3.59%	2.27%
Lifetime Energy Savings (15 years)**	\$15,249.62	\$14,357.25	\$29,606.87
Internal Rate of Return (IRR)	4.73%	8.66%	6.59%
Net Present Value (NPV)	\$1,503.82	\$4,449.77	\$5,955.04

* Additional incentives, based on eligibility, are available through the New Jersey SmartStart Program, see Appendix F.

**3% yearly inflation on electricity costs

***See Appendix H & I for ECRM Financial Analyses

It should be noted that the Annual Energy Savings assume the annual hours per year of operation as outlined under the columns entitled “Proposed Operational Hours without Sensors” and “Proposed Operational Hours with Sensors” in Appendix D.

4.2 HVAC Systems

The goal of this section is to present any heating and cooling energy reduction and cost saving measures that may also be cost beneficial. Where possible, measures will be presented with a life-cycle cost analysis. This analysis displays a payback period based on weighing the capital cost of the measure against predicted annual fiscal savings. To do this, the buildings have been modeled as accurately as possible to predict energy usage for space heating and cooling, as well as domestic hot water use.

Each building is modeled using software called eQuest, a Department of Energy-sponsored energy modeling program, to establish a baseline space heating and cooling energy usage. Climate data from Newark, NJ was used for analyses. From this, the model may be calibrated, using historical utility bills, to predict the impact of theoretical energy savings measures.

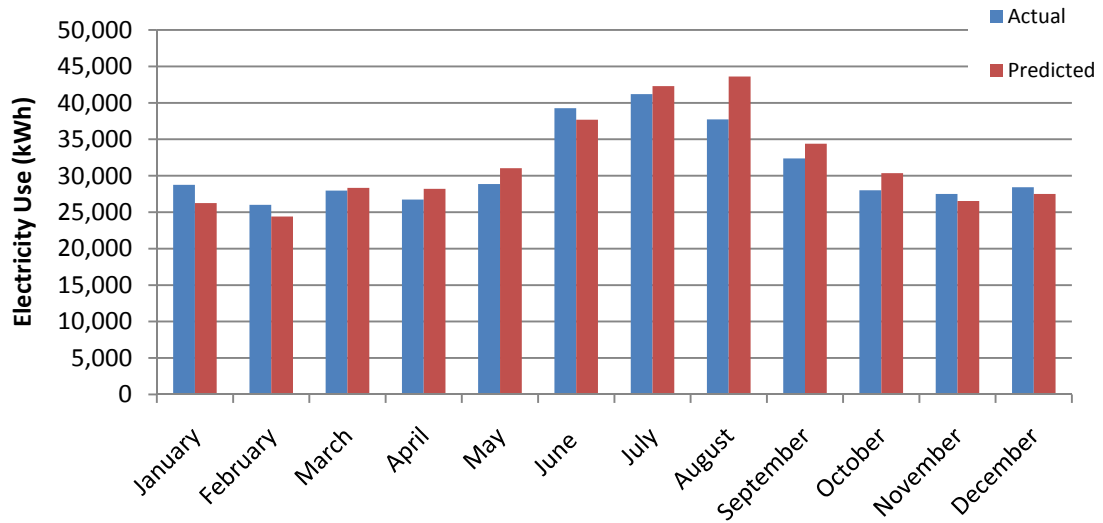
Once annual energy savings from a particular measure have been predicted and the initial capital cost has been estimated, payback periods may be approximated. Equipment cost estimate calculations are provided in Appendix H.

4.2.1 Borough Hall

A model of the Borough Hall was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity bills and natural gas bills from December, 2007 through March, 2009. Figure 4.2-1 below compares actual monthly electricity usages, with those predicted by the eQuest model.

Historical monthly usages were averaged for each month observed over multiple years. For example, usage during the month of June was averaged for the three years, to yield an approximate average usage during the month of June.

Figure 4.2-1: Borough Hall Electricity Usage



Once the eQuest model was calibrated, it could be used to predict approximate major usage categories, such as lighting, plug loads (miscellaneous), ventilation, and cooling. It should be noted that these are only estimated usages based on information gathered during CDM's field audit. Figure 4.2-2 presents this information to help the Borough visualize where CDM anticipates the electricity is ultimately being used.

Figure 4.2-2: Borough Hall Electricity Usage Breakdown

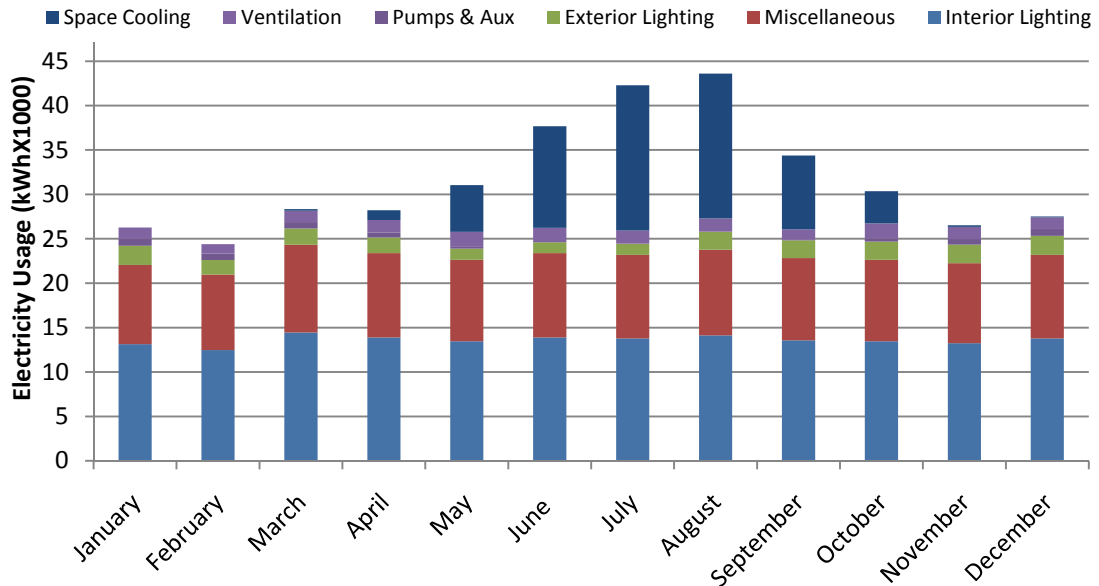
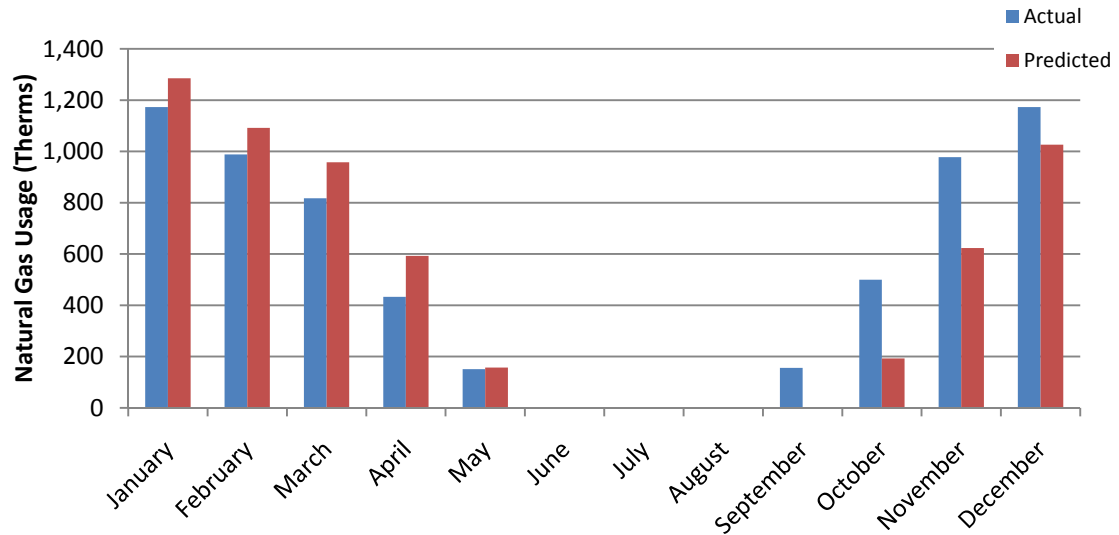


Figure 4.2-3 below compares actual natural gas usage to model-predicted natural gas use.

Figure 4.2-3: Borough Hall Natural Gas Usage

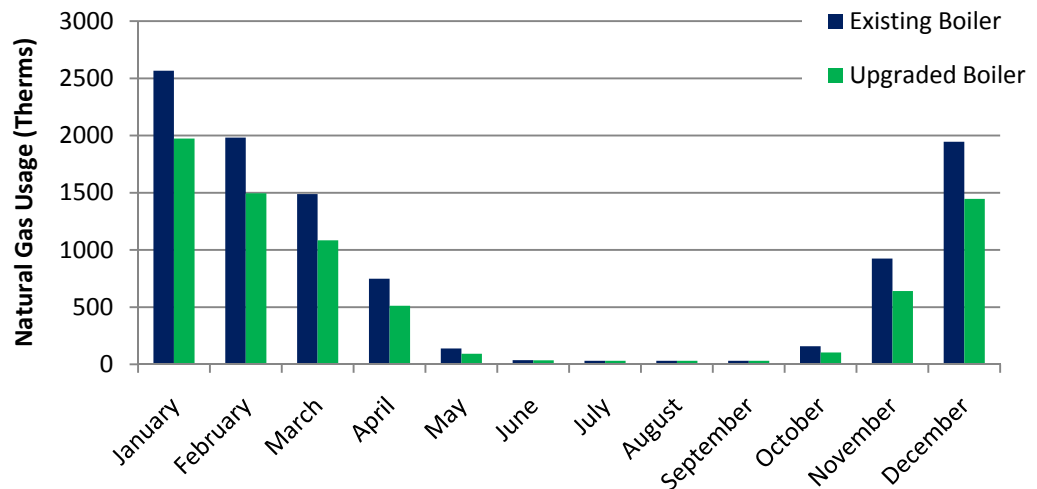


Currently, the heating system utilizes one Slant Fin hot water cast iron boiler with a gross capacity 900 MBH. CDM conservatively estimates this boiler to be 80% efficient.

CDM recommends replacing this boiler with a system of high-efficiency, condensing boilers. Based on the building model, and accounting for a 25% safety factor, CDM has calculated a peak heating load of 1,450 MBH.

Figure 4.2-4 compares current gas usage with predicted gas usage resulting from a switch to a high-efficiency, condensing boiler. Condensing boilers are modeled with a full-load efficiency of ~90% and return water temperature of 120°F.

Figure 4.2-4: Borough Hall – Boiler Upgrade - Natural Gas Usage



Fiscal savings from such an upgrade are then identified in Table 4.2-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix I. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing boiler replacements.

Due to the improved automation and control within modern condensing boilers, their operation and maintenance costs tend to be less than those of typical cast iron boilers. CDM estimates a cast iron boiler system will typically cost around \$3,500 per year for regular preventative maintenance, whereas a condensing boiler system would cost around \$2,000 per year. Therefore, replacing the existing boiler with a condensing boiler should result in an operation and maintenance cost savings of \$1,500 per year.

Table 4.2-1: Borough Hall Boiler Upgrade Payback	
Predicted Annual Savings (Therms)	2,608
Total Annual Savings	\$3,964
Initial Capital Cost of Upgrade	\$67,628
Incentives**	\$2,000
Cost of Upgrade	\$65,628
Annual Maintenance Cost Savings (AMCS)	\$1,500
Simple Payback	12.0
Lifetime Energy Savings (24 years)*	\$120,592
Annual Return on Investment (AROI)	4.16%
Internal Rate of Return (IRR)	9.34%
Net Present Value (NPV)	\$61,689

*Assumes 2% yearly inflation on natural gas costs

**Incentives, per New Jersey Clean Energy Program, are \$1.00 per MBH

It should be noted that reducing the temperature at which the water returns to the boiler (return water temperature) can increase condensing boiler efficiencies. However, to obtain a lower return water temperature, air flows from existing air handling units may need to be reevaluated. Therefore, with the installation of condensing boilers, a complete system test and balance is strongly recommended. This procedure will attempt to maximize system efficiencies, while maintaining adequate ventilation, heating and cooling in all spaces.

Currently the HVAC systems at the Borough Hall are controlled independently, by room thermostats. It is recommended that a direct digital control (DDC) building management system (BMS) be implemented. A system like this would monitor and control all HVAC equipment, allowing maintenance staff to operate systems and adjust climate control in real time to maximize staff and customer comfort, while minimizing unnecessary heating and cooling.

Typically implementation of a BMS will save the owner 5-15% of the energy devoted to HVAC. As all systems are currently independently monitored and controlled, CDM conservatively estimates that implementing a DDC BMS will allow the Borough Hall to save, on average, 10% of the energy being used for HVAC. Table 4.2-2 demonstrates the potential payback from such an implementation.

Table 4.2-2: Borough Hall DDC BMS Payback	
Predicted Annual Savings (Therms)	975
Annual Savings (Natural Gas)	\$1,482
Predicted Annual Savings (kWh)	8,452
Annual Savings (Electricity)	\$1,255
Total Annual Savings	\$2,737
Initial Capital Cost of Upgrade	\$25,685
Incentives**	\$0
Cost of Upgrade	\$25,685
Annual Maintenance Cost Savings (AMCS)	\$0
Simple Payback	9.4
Lifetime Energy Savings (15 years)*	\$48,970
Annual Return on Investment (AROI)	3.99%
Internal Rate of Return (IRR)	9.26%
Net Present Value (NPV)	\$14,174

*Assumes 2% yearly inflation on natural gas costs, 3% inflation on electricity costs

**No Incentives found for this upgrade

If the Borough chooses to pursue such a building management system, CDM recommends hiring an independent energy management consultant to implement the system. An independent consultant can review and adjust the desired control schemes based on the existing HVAC systems and occupancy schedules to maximize the efficiency of the BMS.

Over several decades, ASHRAE has compiled data pertaining to service lives of most HVAC related equipment. From this, ASHRAE indicates a median service life (life until replacement) for HVAC related equipment that may be used as an estimate for the useful life of HVAC equipment currently in service. For example, ASHRAE indicates a window air conditioning unit has a median service life of 10 years. Therefore, if a window unit has been in service for more than 10 years, the owner may want to consider replacement. Not only will a replacement ensure minimal downtime between units (the unit is replaced before it ceases to function), but it will also maintain rated system efficiency, as efficiency tends to decrease with age.

All major equipment noted during CDM's on site audit is listed in Table 4.2-3 below, along with estimated current ages and ASHRAE-expected service lives. It should be noted that only equipment that was observed at the time of the audit is included. Where equipment ages were not found on the equipment tags, they have been estimated based on the unit appearance or approximate renovation dates. In some cases, service locations may have been estimated based on unit proximity. Additionally, in cases where a unit's manufacturer and/or model could not be determined due to an unreadable, faded, destroyed, or lost tag, manufacturer and model number information has been represented as "unknown".

Table 4.2-3 Borough Hall HVAC Equipment Service Lives

Description [Tag ID]	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Air Handling Unit (AHU)	Attic	Court Room	Carrier	39LD1061GA5031-L	N/A*	~15	25
AHU	Attic	Administration Area	Carrier	39LC1061AB1026-L	N/A*	~15	25
Through-Wall Air Conditioner (TWAC)	Basement Computer Room	Basement Computer Room	Sanyo	KS1872	EER 8-9	>10	10
AHU [AHU-1]	Basement	Ambulance Corp	York	N4AHD20A46A	N/A*	<15	25
AHU [AHU-2]	Basement	Police Reserve	York	N4AHD20A46A	N/A*	<15	25
AHU [AHU-3]	Basement	Unknown	York	N4AHD14A46A	N/A*	<15	25
AHU [AHU-4]	Basement	Building Office	York	N4AHD14A46A	N/A*	<15	25
Air Cooled Condensing Unit (ACCU)	Outside	Court Room, Right Side [HVAC-8]	Carrier	38AK-012-601	EER 9.0-9.3	<15	20
ACCU	Outside	Police Hallway, 2 nd Floor [HVAC-5]	Carrier	38AKS009600	EER 9.0	<15	20
ACCU	Outside	Health Department [HVAC-2]	Carrier	38AK-008-601	EER 9.1-9.3	<15	20
ACCU	Outside	Police Hallway, 1 st Floor [HVAC-1]	Carrier	38ARS-008	EER 10.4-11.2	<15	20
ACCU	Outside	Conference Room, 2 nd Floor [HVAC-6]	Carrier	38AK-012-601	EER 9.0-9.3	<15	20
ACCU	Outside	Dispatch	Mitsubishi	PUL12EK	Unknown	<15	20
ACCU	Outside	Basement Computer Room	Sanyo	C1872	Unknown	<15	20
ACCU	Outside	Unknown	York	H3RA060S06B	Unknown	<15	20
ACCU	Outside	Unknown	Lennox	13ACD-060-230-02	Unknown	<15	20

Table 4.2-3 Borough Hall HVAC Equipment Service Lives							
ACCU	Outside	AHU-2	York	E1FD0600S46C	Unknown	<15	20
ACCU (Heat Pump)	Outside	Ambulance Corp	Carrier	38YCC060-641	EER 9.0-9.6	<15	20
ACCU	Outside	Tax and Borough Clerk [HVAC-4]	Carrier	38AK-012-601	EER 9.0-9.3	<15	20
ACCU	Outside	Unknown [HVAC-3]	Carrier	38AK-008-601	EER 9.1-9.3	<15	20
ACCU	Outside	Administration Offices [HVAC-7]	Carrier	38AK-012-600	EER 9.0-9.3	<15	20
ACCU	Outside	Court Room, Left Side [HVAC-9]	Carrier	38AK-012-600	EER 9.0-9.3	<15	20
ACCU	Outside	Unknown	York	E1FB036S46A	Unknown	<15	20
ACCU	Outside	AHU-4	York	E1FD036S06D	Unknown	<15	20
AHU	Over Sally Port	Police Office Hallway	Carrier	39LA1031BA1021-R	N/A*	<15	25
AHU	Over Sally Port	Police Office Area	Carrier	39LC1061AB1026	N/A*	<15	25
Boiler, Cast Iron	Boiler Room	Entire Building	Slant Fin	Unknown	80%	15	35

*Heating efficiencies for air handling units with hot water coils accounted for at boiler; cooling efficiencies accounted for at condensing units.

As the ASHRAE expected life for an air-cooled condensing unit is 20 years, the ACCUs at the Borough Hall should still be operating reliably and efficiently and therefore should not warrant immediate replacement. Additionally, CDM has found that a direct replacement of a standard efficiency ACCU with a high efficiency model tends to not be cost beneficial.

However, in approximately five years when the units begin to exceed their expected service lives, the Borough will begin to incur the costs of unit replacements. At this point, CDM recommends evaluating the cost of replacing them with high-efficiency units. The savings realized from a high efficiency unit is often enough to justify the cost difference between replacement with a high efficiency unit and direct replacement with a standard efficiency unit.

Additionally, at the time of the audit, the air handling unit above the “Sally Port” was found to have a significant condensate leak which has caused damage to the ceiling below the unit, resulting in costly repairs. As this unit is still within its expected service life, it is recommended the unit be repaired to mitigate costs associated with anticipated continued ceiling and structure damage.

CDM also creates an inventory of observed domestic water heaters. This will attempt to inform the Borough of any water heaters that are in need of replacement. Equipment observed to be in poor or aging condition would warrant replacement, as they are likely not operating at peak efficiency. This domestic water heater inventory may be seen as Table 4.2-4 below.

Table 4.2-4 Borough Hall Domestic Water Heaters						
Location	Make	Storage Capacity (Gallons)	Model Number	Type	Heating Capacity	Observed Condition
Boiler Room	Bradford White	100	M1100T10BN	Gas	100 MBH	Good

4.2.2 Public Library

A model of the Public Library was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity bills and natural gas bills from December, 2007 through December, 2009. Figure 4.2-5 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years.

Figure 4.2-5: Public Library Electricity Usage

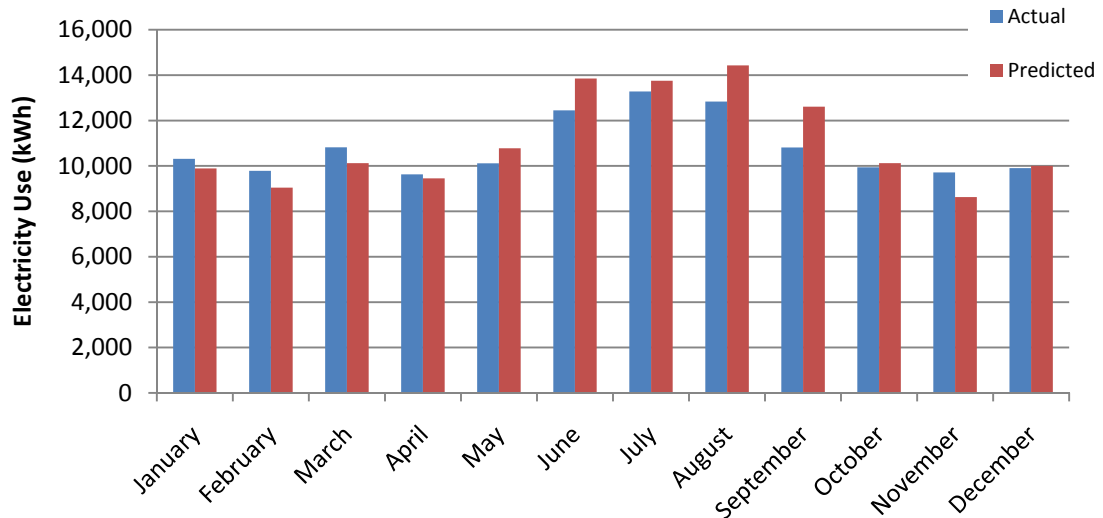


Figure 4.2-6 presents an end-usage breakdown to help the Borough visualize where CDM anticipates the electricity is ultimately being used. It should be noted that these are only estimated usages based on information gathered during CDM's field audit.

Figure 4.2-6: Public Library Electricity Usage Breakdown

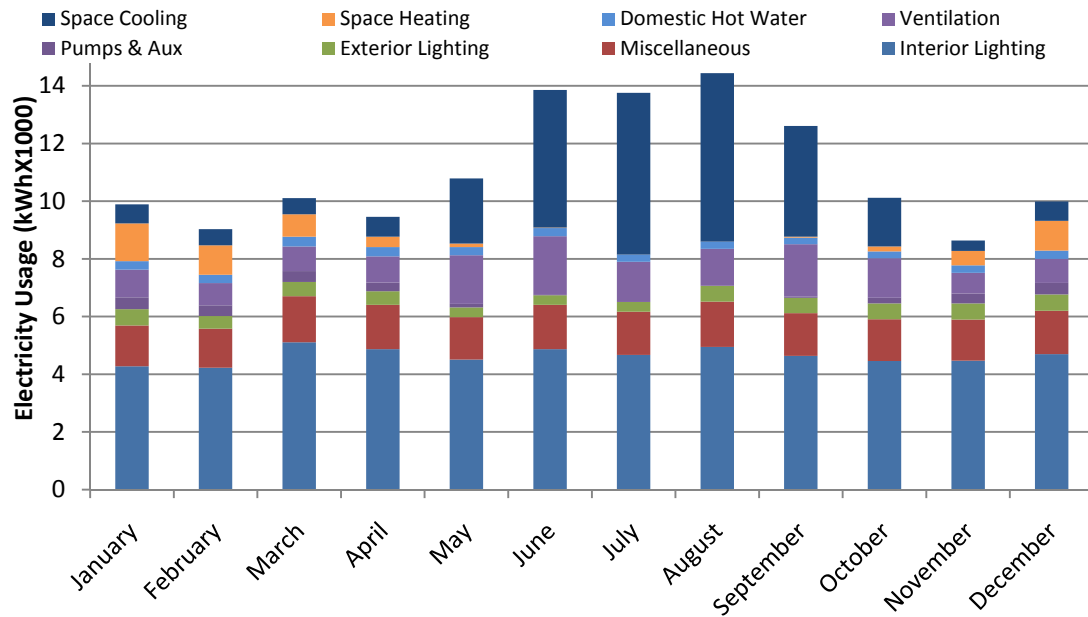
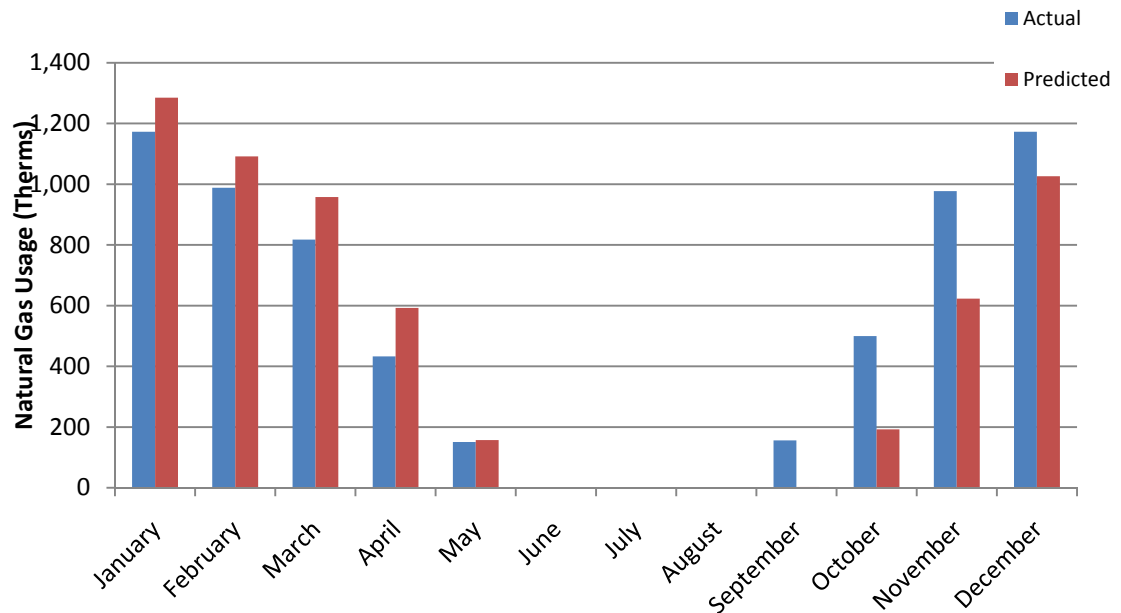


Figure 4.2-7 below compares actual natural gas usage to model-predicted natural gas use.

Figure 4.2-7: Public Library Natural Gas Usage



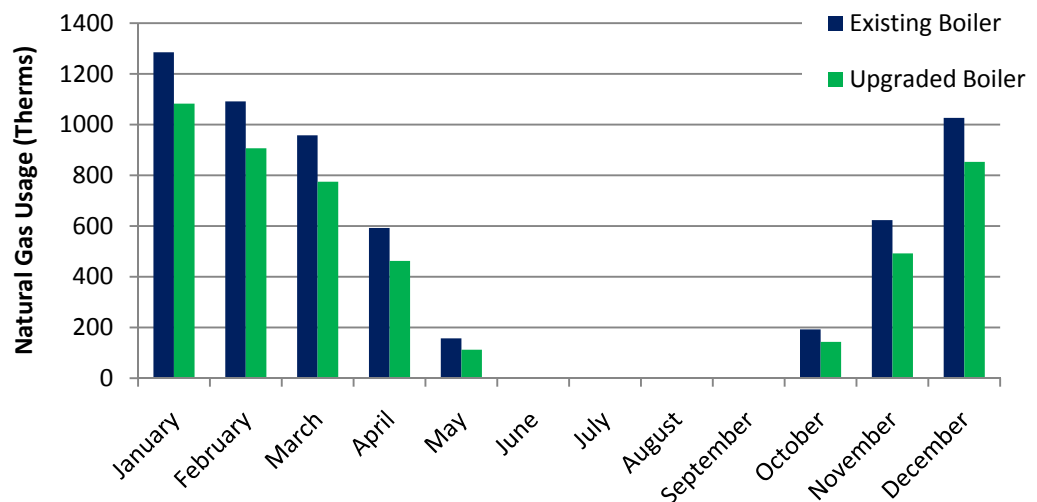
The existing boiler at the Public Library generates steam that is then used to heat water through a heat exchanger. This water is then circulated to all unit heating coils throughout the building. There is very little need for the existing steam system in the building. Only a select few stairwells utilize steam heat, as the majority of the building is heated by the hot water system. By switching to a hot water boiler, the Borough can potentially realize significant energy savings.

Currently, the heating system utilizes one Smith steam cast iron boiler which can generate 710 lbs of steam per hour, which equates to a gross output capacity 688 MBH. CDM conservatively estimates this boiler to be 80% efficient.

CDM recommends replacing this boiler with a system of high-efficiency, condensing boilers. Based on the building model, and accounting for a 25% safety factor, CDM has calculated a peak heating load of 866 MBH.

Figure 4.2-8 compares current gas usage with predicted gas usage resulting from a switch to a high-efficiency, condensing boiler. Condensing boilers are modeled with a full-load efficiency of ~90% and return water temperature of 120°F.

Figure 4.2-8: Public Library – Boiler Upgrade - Natural Gas Usage



Fiscal savings from such an upgrade are then identified in Table 4.2-5 below. Lifetime savings calculations for all ECRM's may be found in Appendix I. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing boiler replacements.

Due to the improved automation and control within modern condensing boilers, their operation and maintenance costs tend to be less than those of typical cast iron boilers. CDM estimates a cast iron boiler system will typically cost around \$3,500 per year for regular preventative maintenance, whereas a condensing boiler system would cost around \$2,000 per year. Therefore, replacing the existing boiler with a condensing boiler should result in an operation and maintenance cost savings of \$1,500 per year.

Table 4.2-5: Public Library Boiler Upgrade Payback	
Predicted Annual Savings (Therms)	1,100
Total Annual Savings	\$1,353
Initial Capital Cost of Upgrade	\$32,122
Incentives**	\$1,552
Cost of Upgrade	\$30,570
Annual Maintenance Cost Savings (AMCS)	\$1,500
Simple Payback	10.7
Lifetime Energy Savings (24 years)*	\$41,161
Annual Return on Investment (AROI)	5.17%
Internal Rate of Return (IRR)	7.23%
Net Present Value (NPV)	\$35,908

*Assumes 2% yearly inflation on natural gas costs

**Incentives, per New Jersey Clean Energy Program, are \$2.00 per MBH

It should be noted that reducing the temperature at which the water returns to the boiler (return water temperature) can increase condensing boiler efficiencies. However, to obtain a lower return water temperature, air flows from existing air handling units may need to be reevaluated. Therefore, with the installation of condensing boilers, a complete system test and balance is strongly recommended. This procedure will attempt to maximize system efficiencies, while maintaining adequate ventilation, heating and cooling in all spaces.

Currently, the HVAC equipment at the library is controlled by a third-party company. Library personnel expressed interest in implementing a building management system (BMS) that they have control over. A system like this would monitor and control all HVAC equipment, allowing library staff to operate systems and adjust climate control in real time to maximize staff and customer comfort, while minimizing unnecessary heating and cooling.

Typically, implementation of a BMS will save the owner 5-15% of the energy devoted to HVAC. While there is a third party control system currently implemented, staff has noted that systems such as the air handling unit serving the lower level auditorium run constantly to cool or heat the space even when it is completely unoccupied. If a DDC BMS monitored and controlled by library staff is implemented, systems such as this one can be set to only operate when needed, and adjustments can be made in real time to respond occupant needs. Therefore, CDM conservatively estimates that implementing a DDC BMS will allow the library to save, on average, 5% of the energy being used for HVAC. Table 4.2-6 demonstrates the potential payback from such an implementation.

Table 4.2-6: Public Library DDC BMS Payback	
Predicted Annual Savings (Therms)	296
Annual Savings (Natural Gas)	\$364
Predicted Annual Savings (kWh)	2,503
Annual Savings (Electricity)	\$462
Total Annual Savings	\$826
Initial Capital Cost of Upgrade	\$13,800
Incentives**	\$0
Cost of Upgrade	\$13,800
Annual Maintenance Cost Savings (AMCS)	\$0
Simple Payback	16.7
Lifetime Energy Savings (15 years)*	\$14,888
Annual Return on Investment (AROI)	(0.68%)
Internal Rate of Return (IRR)	1.28%
Net Present Value (NPV)	(\$1,771)

*Assumes 2% yearly inflation on natural gas costs, 3% inflation on electricity costs

**No Incentives found for this upgrade

If the Borough chooses to pursue such a building management system, CDM recommends hiring an independent energy management consultant to implement the system. An independent consultant can review and adjust the desired control schemes based on the existing HVAC systems and occupancy schedules to maximize the efficiency of the BMS.

All major equipment noted during CDM's on site audit is listed in Table 4.2-7 below, along with estimated current ages and ASHRAE-expected service lives. It should be noted that only equipment that was observed at the time of the audit is included.

Table 4.2-7 Public Library HVAC Equipment Service Lives							
Description [Tag ID]	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
AHU [AHU-2]	Attic	Children's Section	Carrier	38RR016500	N/A	20-25	25
[AHU-1]	Attic	Office Area	Carrier	Unknown	N/A	15-20	25
ACCU [ACCU-5]	Roof	Adult's Section	Trane	TTA180B300BA	EER 10-11	16	20
ACCU [ACCU-6]	Roof	Entryway	Sanyo	CH1232	Unknown	9	20
ACCU [ACCU-2]	Roof	Children's Section	Trane	TTA120B300BA	EER 10-11	16	20

Table 4.2-7 Public Library HVAC Equipment Service Lives							
ACCU [ACCU-1]	Roof	Office Area	Trane	TTR060C100A2	EER 10-11	16	20
ACCU [ACCU-3]	Roof	Lower Level Auditorium	Trane	TTA120B300BA	EER 10-11	16	20
AHU	Lower Level Mechanical Room	Lower Level Auditorium	Trane	TWE120B300BB	N/A	16	25
Electric Unit Heater (EUH)	Foyer	Foyer	Sanyo	FH1232	100%	<13	13
Boiler, Cast Iron	Boiler Room	Entire Building	HB Smith	Unknown	80%	29	35

A domestic water heater inventory may be seen as Table 4.2-8 below.

Table 4.2-8 Public Library Domestic Water Heaters						
Location	Make	Storage Capacity (Gallons)	Model Number	Type	Heating Capacity	Observed Condition
Boiler Room	AO Smith	50	ECL 50 200	Electric	3.5 kW	Good

4.2.3 DPW Main Building

A model of the main building on the Department of Public Works Complex was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity bills and natural gas bills from December, 2007 through March, 2009. Figure 4.2-9 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years.

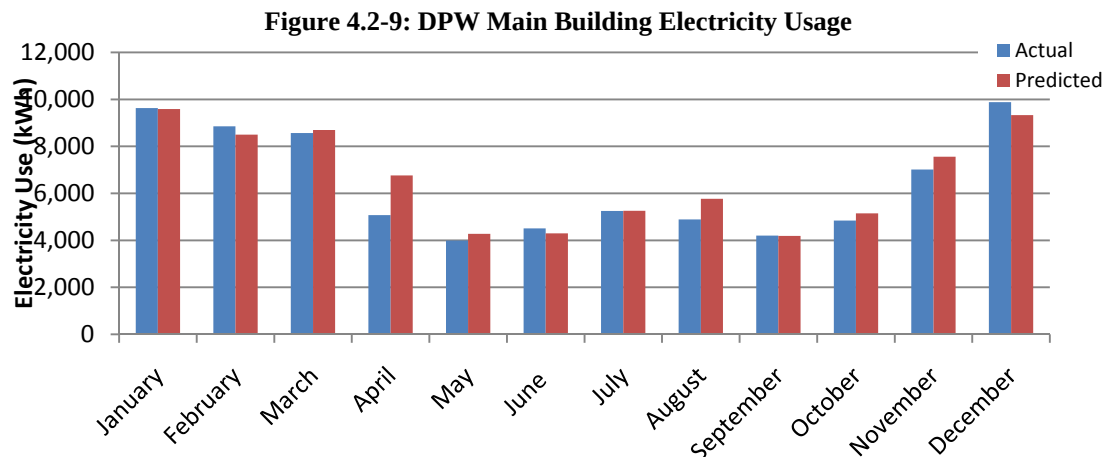


Figure 4.2-10 presents an end-usage breakdown to help the Borough visualize where CDM anticipates the electricity is ultimately being used. It should be noted that these are only estimated usages based on information gathered during CDM's field audit.

Figure 4.2-10: DPW Main Building Electricity Usage Breakdown

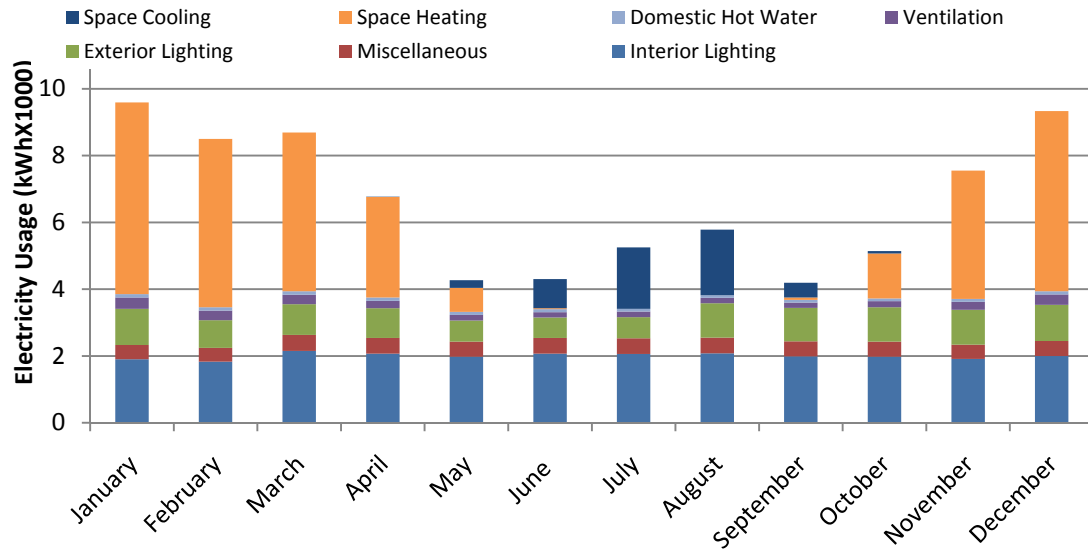
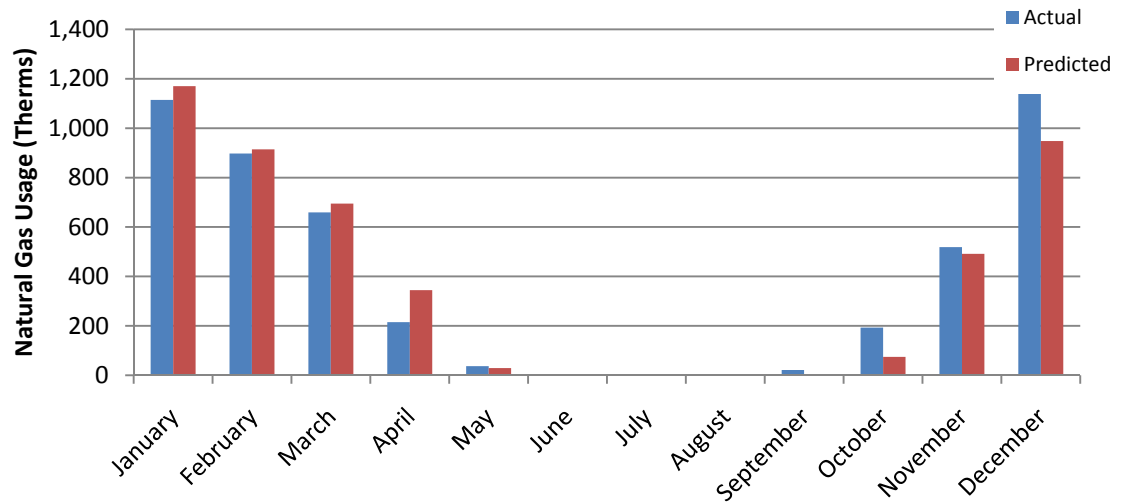


Figure 4.2-11 below compares actual natural gas usage to model-predicted natural gas use.

Figure 4.2-11: DPW Main Building Natural Gas Usage



All major equipment noted during CDM's on site audit is listed in Table 4.2-9 below, along with estimated current ages and ASHRAE-expected service lives. It should be noted that only equipment that was observed at the time of the audit is included.

Table 4.2-9 DPW Main Building HVAC Equipment Service Lives							
Description [Tag ID]	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Gas-Fired Unit Heater (GFUH)	Garage	Garage	Reznor	Unknown	80%	15-20	13
GFUH	Garage	Garage	Reznor	Unknown	80%	15-20	13
GFUH	Garage	Garage	Reznor	Unknown	80%	15-20	13
GFUH	Garage	Garage	Reznor	Unknown	80%	15-20	13
Window Air Conditioner (WAC)	Ready Room	Ready Room	Friedrich	Unknown	EER 8-9	<10	10
WAC	Office	Office	GE	Unknown	EER 8-9	<10	10
WAC	Office	Office	GE	Unknown	EER 8-9	<10	10
WAC	Break Room	Break Room	Whirlpool	Unknown	EER 8-9	<10	10

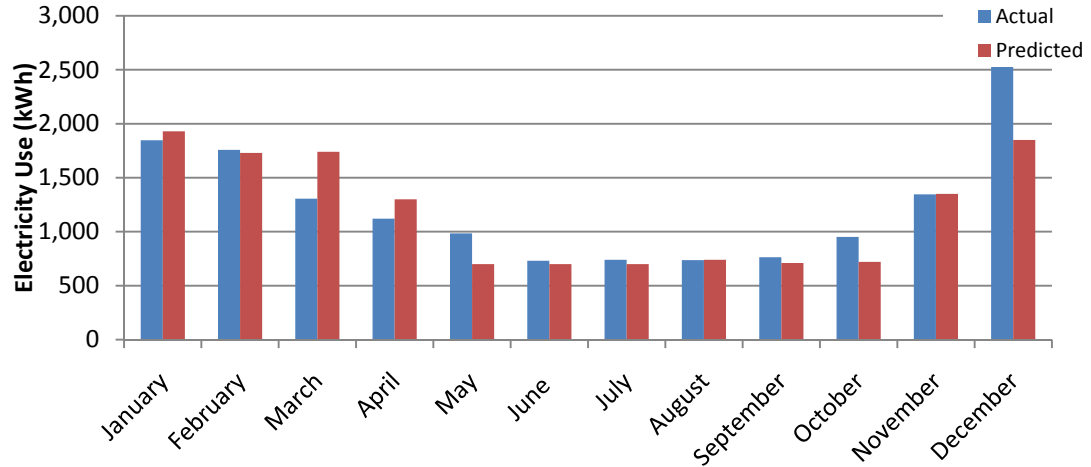
A domestic water heater inventory may be seen as Table 4.2-10 below.

Table 4.2-10 DPW Main Building Domestic Water Heaters						
Location	Make	Storage Capacity (Gallons)	Model Number	Type	Heating Capacity	Observed Condition
Bathroom	Rheem	50	81V52DC	Electric	4.5 kW	Good

4.2.4 DPW Garage

A model of the Garage Building on the Department of Public Works Complex was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity bills and natural gas bills from December, 2007 through March, 2009. Figure 4.2-12 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years.

Figure 4.2-12: DPW Garage Electricity Usage



The upward trend in usage during the winter months is likely attributed to the use of electric engine block heaters, as no electric-resistance heating units were noted. However, as eQuest does not have the capacity to accurately account for block heater usage, the model has assumed a small electric heat load to mimic this usage.

Figure 4.2-13 presents an end-usage breakdown to help the Borough visualize where CDM anticipates the electricity is ultimately being used. It should be noted that these are only estimated usages based on information gathered during CDM’s field audit. The category “Space Heating” in this Figure represents usage likely attributed to engine block heaters.

Figure 4.2-13: DPW Garage Electricity Usage Breakdown

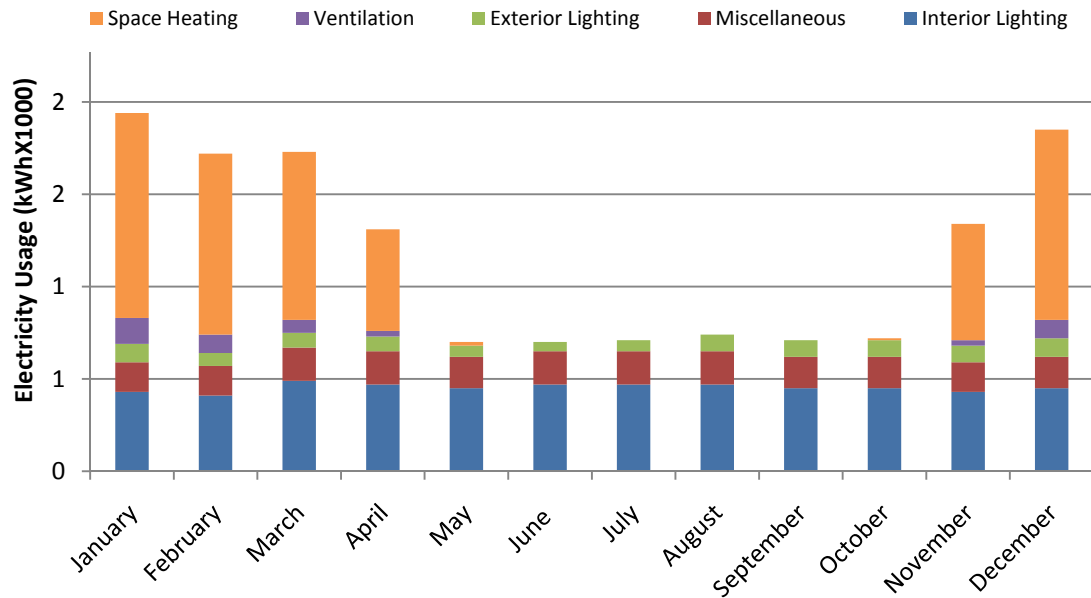
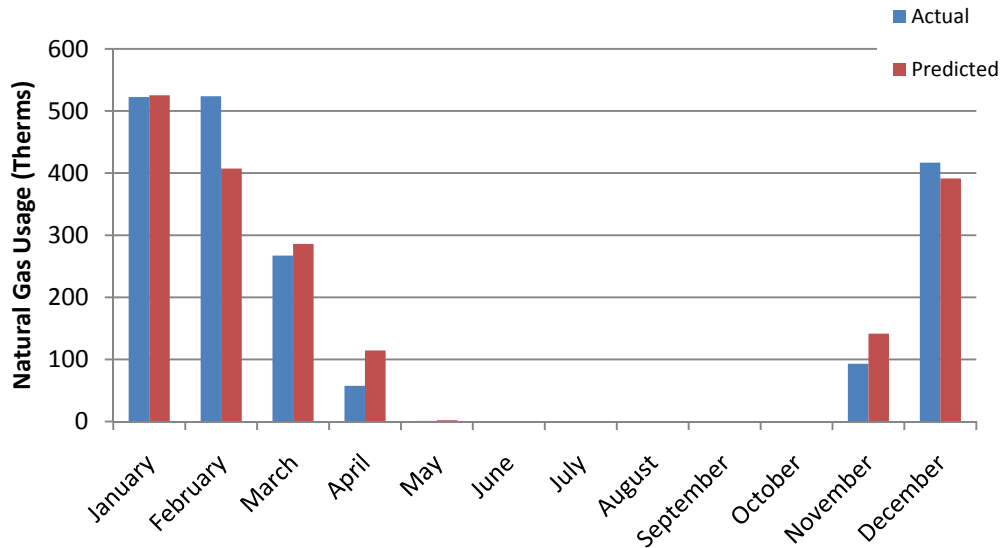


Figure 4.2-14 below compares actual natural gas usage to model-predicted natural gas use.

Figure 4.2-14: DPW Garage Natural Gas Usage



As all of the HVAC equipment is operating well and efficiently, CDM has no HVAC-related recommendations for this building.

All major equipment noted during CDM's on site audit is listed in Table 4.2-11 below, along with estimated current ages and ASHRAE-expected service lives. It should be noted that only equipment that was observed at the time of the audit is included.

Table 4.2-11 DPW Garage HVAC Equipment Service Lives							
Description [Tag ID]	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Radiant Tube Heater (RTH)	Garage	Garage	Roberts Gordon	Gordon Ray BH	80%	<18	18
RTH	Garage	Garage	Roberts Gordon	Gordon Ray BH	80%	<18	18
RTH	Garage	Garage	Roberts Gordon	Gordon Ray BH	80%	<18	18
RTH	Garage	Garage	Roberts Gordon	Gordon Ray BH	80%	<18	18
RTH	Garage	Garage	Roberts Gordon	Gordon Ray BH	80%	<18	18

4.2.5 Fire Department

A model of the Fire Department was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity bills and natural gas bills from December, 2007 through March, 2009. Figure 4.2-15 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years.

Figure 4.2-15: Fire Department Electricity Usage

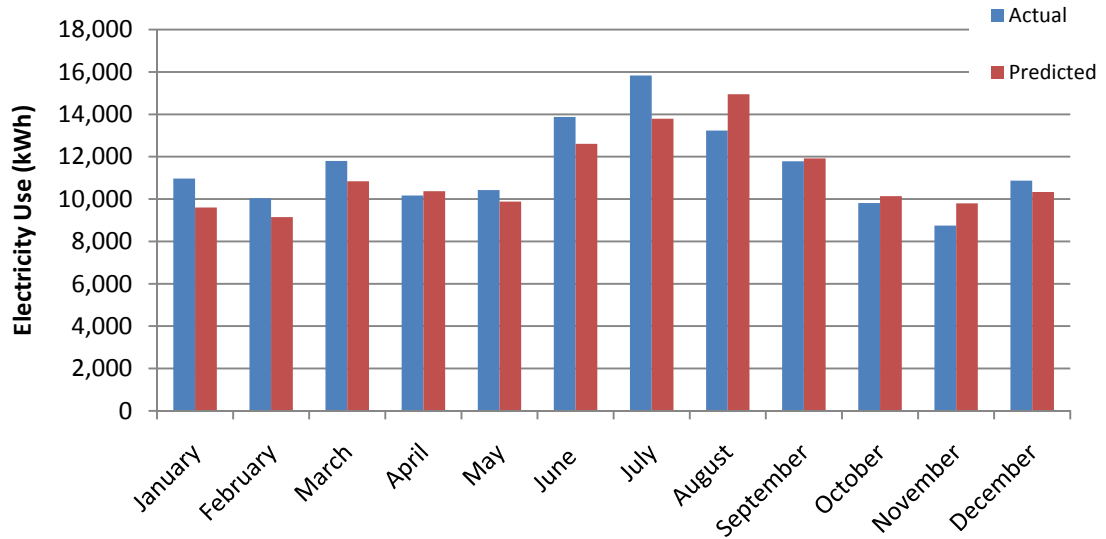


Figure 4.2-16 presents an end-usage breakdown to help the Borough visualize where CDM anticipates the electricity is ultimately being used. It should be noted that these are only estimated usages based on information gathered during CDM's field audit.

Figure 4.2-16: Fire Department Electricity Usage Breakdown

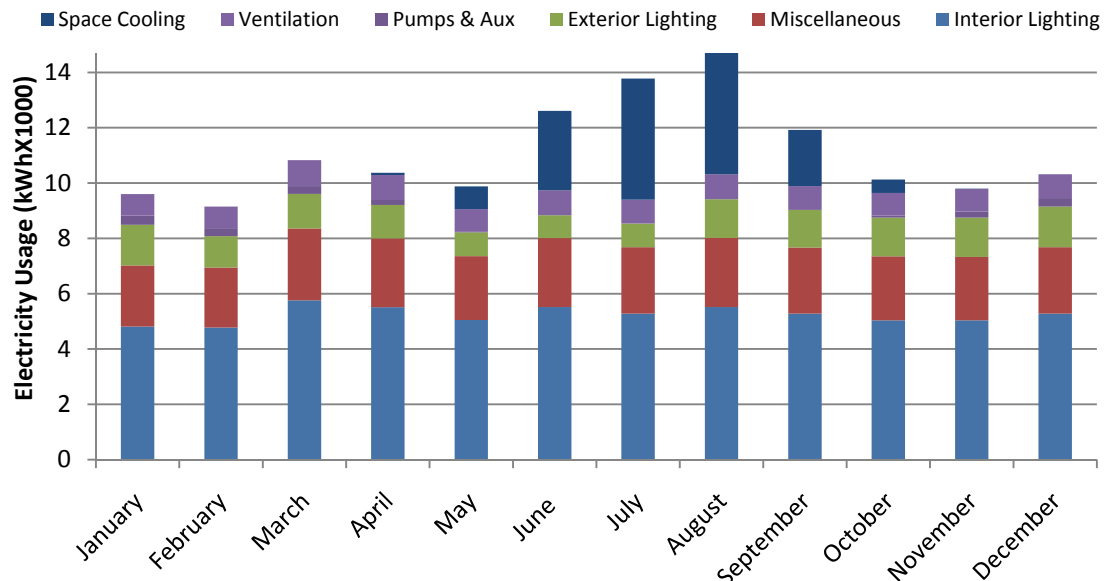
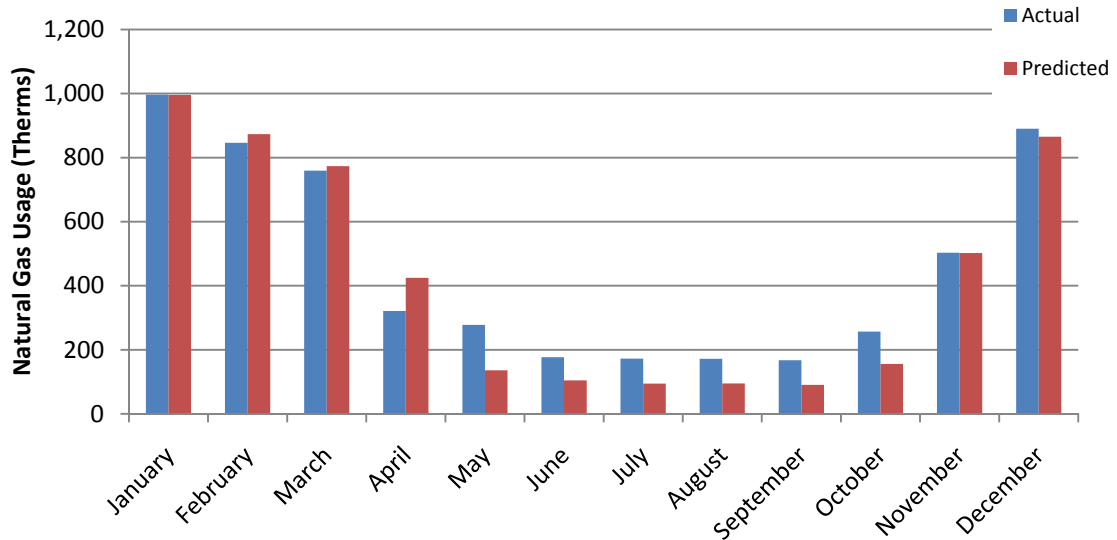


Figure 4.2-17 below compares actual natural gas usage to model-predicted natural gas use.

Figure 4.2-17: Fire Department Natural Gas Usage



As this building is fairly new, and all of the HVAC equipment is operating well and efficiently, CDM has no HVAC-related recommendations for this building.

All major equipment noted during CDM's on site audit is listed in Table 4.2-12 below, along with estimated current ages and ASHRAE-expected service lives. It should be noted that only equipment that was observed at the time of the audit is included.

Table 4.2-12 Fire Department HVAC Equipment Service Lives							
Description [Tag ID]	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
RTH	Garage	Garage	Re-Verber-Ray	XTS-30-50N	80%	5	18
RTH	Garage	Garage	Re-Verber-Ray	XTS-30-50N	80%	5	18
RTH	Garage	Garage	Re-Verber-Ray	XTS-30-50N	80%	5	18
RTH	Garage	Garage	Re-Verber-Ray	XTS-30-50N	80%	5	18
Rooftop Unit (RTU)	Roof	Third Floor	York	Y12AN44E9KAQBAF	80% Heating EER 10-11	5	15
RTU	Roof	Second Floor/Mezzanine	York	DH078N15C4AAA3C	80% Heating EER 11.5	5	15

Table 4.2-12 Fire Department HVAC Equipment Service Lives							
RTU	Roof	Third Floor	York	DH060N10P4AAA1A	80% Heating EER 11.5	5	15
Boiler, Firetube	Basement	Stairwells and Bathrooms	Munchkin	Unknown	80%	5	25

A domestic water heater inventory may be seen as Table 4.2-13 below.

Table 4.2-13 Fire Department Domestic Water Heaters						
Location	Make	Storage Capacity (Gallons)	Model Number	Type	Heating Capacity	Observed Condition
Basement	Rheem	75	42VP75FW	Gas	75 MBH	Good

4.3 Alternative Energy Sources

4.3.1 Photovoltaic Solar Energy System Overview

Photovoltaic (PV) cells convert energy in sunlight directly into electrical energy through the use of silicon semi conductors, diodes and collection grids. Several PV cells are then linked together in a single frame of module to become a solar panel. PV cells are able to convert the energy from the sun into electricity. The angle of inclination of the PV cells, the amount of sunlight available, the orientation of the panels, the amount of physical space available and the efficiency of the individual panels are all factors that affect the amount of electricity that is generated.

Based on the estimated cumulative total available roof area, calculations determine that the installation of five systems with a total rating of approximately 130 kW (dc) will be appropriate for the five Borough Buildings listed below.

As part of this energy audit, a preliminary engineering feasibility study of the sites outlined above to support solar generation facilities was completed consisting of the following tasks:

- a. Site Visit by our engineers.
- b. Satellite Image Analysis and Conceptual design and layout of the photovoltaic system
- c. Design and construction cost estimates
- d. Determine a preliminary design for the size and energy production of the solar system.

The total unobstructed available area of each section of the roof with southern exposure was evaluated. It is important to note the following:

1. The structural integrity of the roofs was not confirmed during our site visit. The municipal buildings may require some degree of roofing work prior to the implementation of a solar system.
2. In the case of the flat areas, the PV system sizing and kWh production was calculated assuming the installation of a crystalline module facing south direction (180 Degree Azimuth) and tilted approximately 20 degrees to allow better rain water shedding and snow melting. Please note that the kWh production as well as system size may differ significantly based on final panel tilt selected during the RFP and design phase.
3. Blended electric rates were used based on actual utility bills and were applied for the facility.

The following is a preliminary study on the feasibility of installing PV solar systems at the five Borough buildings to generate a portion of each facility's electricity requirements. Each system is designed to offset the electric purchased from the local utility and not as a backup or emergency source of power.

In order to determine the best location for the installation of the PV solar system, a satellite image analysis and site walkthrough of the buildings was performed on February 3rd. As per the Scope of Work, only the building roofs were considered for PV installation.

Also, as part of our assessment we investigated possible locations for electrical equipment that need to be installed such as combiner boxes, disconnect switches and DC to AC inverters. Consideration was also given to locations of interconnection between the solar system and building's electrical grid.

4.3.1.1 Borough Hall Building

The roof of the Borough Hall Building is a pitched roof with very few obstructions. The few obstructions include some vent piping, two chimneys, and an ornamental structure at the peak. There is no amount of shading on the roof from adjacent foliage that would need to be addressed during the design phase of the project. The structural integrity of the roof was not confirmed although a visual inspection revealed no leaks or major defects. The structural integrity of the roof and the existence of a warranty shall be confirmed prior to the implementation of a PV system.

The Project Team conducted both a facility walkthrough and a satellite image analysis and based on the estimated total available area we calculated the installation of a solar system, rated at approximately 34.3 kW (dc).

Electrical Service

The existing electrical service size of the Borough Hall Building is 3-phase, 277/480V, at 600 Amps. The interconnection point for the PV system will require a modification or replacement of the existing service entrance equipment wherein the PV system feeder connections will have to be made after the main circuit breaker, and protective

relaying will also have to be implemented. Any connection points would have to meet NEC and local utility requirements. Further investigation and verification of existing electrical equipment would be required prior to implementation of a PV system.

4.3.1.2 Public Library

The roof of the Public Library is a pitched roof with a very few obstructions such as exhaust fans, rooftop HVAC units, and electrical and gas piping. There is a minimal amount of shading on the roof from adjacent foliage that would need to be addressed during the design phase of the project. The structural integrity of the roof was not confirmed although a visual inspection revealed no leaks or major defects. The structural integrity of the roof and the existence of a warranty shall be confirmed prior to the implementation of a PV system.

The Project Team conducted both a facility walkthrough and a satellite image analysis and based on the estimated total available area we calculated the installation of a solar system, rated at approximately 16.8 kW (dc).

Electrical Service

The existing electrical service size of the Public Library is 3-phase, 120/208V, at 800 Amps. The interconnection point for the PV system will require a modification or replacement of the existing service entrance equipment wherein the PV system feeder connections will have to be made after the main circuit breaker, and protective relaying will also have to be implemented. Any connection points would have to meet NEC and local utility requirements. Further investigation and verification of existing electrical equipment would be required prior to implementation of a PV system.

4.3.1.3 DPW Main Building

The roof of the DPW Main Building is a combination of a pitched roof with very few obstructions and a flat roof over the work shop area. These flat surfaces have few obstructions such as exhaust fans, a chimney, and electrical and gas piping. There is no amount of shading on the roof from adjacent foliage that would need to be addressed during the design phase of the project. The structural integrity of the roof was not confirmed although a visual inspection revealed no leaks or major defects. The structural integrity of the roof and the existence of a warranty shall be confirmed prior to the implementation of a PV system.

The Project Team conducted both a facility walkthrough and a satellite image analysis and based on the estimated total available area we calculated the installation of a solar system, rated at approximately 55 kW (dc).

Electrical Service

The existing electrical service size of the DPW Main Building is 1-phase, 120/240V, at 200 Amps. The interconnection point for the PV system will require a modification or replacement of the existing service entrance equipment wherein the PV system feeder connections will have to be made after the main circuit breaker, and protective

relaying will also have to be implemented. Any connection points would have to meet NEC and local utility requirements. Further investigation and verification of existing electrical equipment would be required prior to implementation of a PV system.

4.3.1.4 DPW Garage

The roof of the DPW Garage is a pitched roof with a very few obstructions such as electrical and gas piping. There is no amount of shading on the roof from adjacent foliage that would need to be addressed during the design phase of the project. The structural integrity of the roof was not confirmed although a visual inspection revealed no leaks or major defects. The structural integrity of the roof and the existence of a warranty shall be confirmed prior to the implementation of a PV system.

The Project Team conducted both a facility walkthrough and a satellite image analysis and based on the estimated total available area we calculated the installation of a solar system, rated at approximately 11.5 kW (dc).

Electrical Service

The existing electrical service size of the DPW Garage is 1-phase, 120/240V, at 200 Amps. The interconnection point for the PV system will require a modification or replacement of the existing service entrance equipment wherein the PV system feeder connections will have to be made after the main circuit breaker, and protective relaying will also have to be implemented. Any connection points would have to meet NEC and local utility requirements. Further investigation and verification of existing electrical equipment would be required prior to implementation of a PV system.

4.3.1.5 Fire Department

The roof of the Fire Department is a flat roof with some obstructions such as exhaust fans, rooftop HVAC units, and electrical and gas piping. There is no amount of shading on the roof from adjacent foliage that would need to be addressed during the design phase of the project. The structural integrity of the roof was not confirmed although a visual inspection revealed no leaks or major defects. The structural integrity of the roof and the existence of a warranty shall be confirmed prior to the implementation of a PV system.

The Project Team conducted both a facility walkthrough and a satellite image analysis and based on the estimated total available area we calculated the installation of a solar system, rated at approximately 12.1 kW (dc).

Electrical Service

The existing electrical service size of the Fire Department is 3-phase, 277/480V, at 200 Amps. The interconnection point for the PV system will require a modification or replacement of the existing service entrance equipment wherein the PV system feeder connections will have to be made after the main circuit breaker, and protective relaying will also have to be implemented. Any connection points would have to

meet NEC and local utility requirements. Further investigation and verification of existing electrical equipment would be required prior to implementation of a PV system.

4.3.1.6 Basis for Design and Calculations

The proposed Photovoltaic (PV) Power systems outlined above for each facility are comprised of the PV arrays, inverter(s), combiner boxes, disconnect switches, and all of the necessary wiring and interconnection equipment. The solar panels will be mounted onto the roof. The array outputs will feed power into the DC to AC inverters. AC outputs will then be connected at each building's electrical service as outlined above. Pending further engineering analysis of the roofs, it is yet to be determined if the solar arrays will be installed using a self-ballasting system, or roof penetration system, or a combination of both.



Fixed Tilt System

The most common roof mounted system is referred to as a ("fixed tilt") system typically mounted to a metal rack that can be fixed at a specific angle. There are also ("tracking systems") or movable along one or two axes to follow the position of the sun during the day. For a roof-mounted PV system, tracking systems are very rarely installed and are usually used for ground-mounted systems only, as they require more complex racks and higher maintenance costs. For the "fixed" system, the tilt is determined based on the following factors: geographical location, total targeted kWh production, seasonal electricity requirements and weather conditions such as wind. Ideally, the module tilt for Central to Eastern New Jersey should be 25-35 degrees with an azimuth as close as possible to 180 (south); however, our experience has shown that PV systems are typically installed at a tilt of 20 degrees or lower in order to avoid any issues with wind and to maximize total system size

The type of PV panels and equipment used to mount the system shall be determined based on the wind conditions and structural integrity of the roof determined during the design phase of the project. In general, penetration/tie-down systems, non-penetrating ballasted type systems, or a combination of the two should be considered.

In addition to the installation of the solar panels, the roof of the Borough Hall building should be replaced prior to panel installation. Due to the excessive age of the roof, it is necessary that the roof be demolished and replaced before any panel installation is finalized for its lifetime.

Calculation of PV System Yield

An industry accepted software package PV Watts was used to calculate projected annual electrical production of the crystalline silicon PV system in its first year, as summarized in Table 4.3-1. The system was designed to provide maximum kWh production based on available roof space.

Table 4.3-1 Summary of Solar (PV) Systems

Site	Est. Area (ft ²)	kWh	Annual Energy Savings	Est. Annual SREC	Lifetime Energy Savings (25 Years)*	Annual Return On Investment (ARO I)	Net Present Value (NPV)	Internal Rate of Return (IRR)
Borough Hall	3,426	41,170	\$6,113.7	\$27,790	\$222,901	2.6%	-\$96,243	0.7%
Public Library	1,684	20,237	\$3,735.8	\$13,660	\$136,205	1.5%	-\$94,152	-0.6%
DPW Main Building	5,502	66,118	\$9,805.3	\$44,360	\$357,494	3.3%	-\$79,111	1.8%
DPW Garage	1,150	14,094	\$2,460.8	\$9,513	\$89,719	0.7%	-\$104,172	-2.1%
Fire Department	1,212	14,565	\$2,152.7	\$9,831	\$78,486	0.6%	-\$115,055	-2.7%

*3% yearly inflation on electricity costs

Total Costs

It should be noted that construction costs are only estimates based on historic data compiled from similar installations, and engineering opinion. Additional engineering and analysis is required to confirm the condition of the roofs, structural integrity of the roofs, the system type, sizing, costs and savings. Budget costs assume existing roofs are structurally sound, do not need to be replaced, and can accommodate a solar system. For illustration purposes, a draft financial analysis pro forma is attached outlining all project costs and revenues.

Table 4.3-2 Engineers Opinion of Probable Cost

Engineers Opinion of Probable Cost	\$2,084,575
---	--------------------

As stated above the estimated installation costs are based on significant experience with the pricing of solar installations in New Jersey, and are intended to provide the Borough with a realistic budget cost. A typical solar installation can vary in cost from \$7.00 - \$10.00 per watt depending on size, complexity of the system, labor rates, etc. Approximately 60-70% of that number is material costs while the balance is labor, engineering, etc. Like any installation, certain conditions can affect a price upward or downward. For purposes of this analysis the estimated installation cost does not include any roofing or structural work which may be required to maintain warranties or for additional structural support. We have included a budget of \$9/watt for the solar system installation with an additional estimated budget of \$100,000 for potential electric service work.

Refer to Section 7 for discussion on Solar Renewable Energy Certificates and other financing options for solar projects. The financial model in Appendix E provides an annual forecast illustration of project revenues and costs for 25 years.

4.3.2 Geothermal Energy

Geothermal systems utilize the constant temperature of the earth throughout the year (at depths from 5 ft. to 1,000 ft. the earth temperature remains at 53 deg. F) as the primary source of energy for the heating/cooling and domestic hot water production. Additionally, since the earth is maintained at a constant temperature from heat absorbed from the sun this energy is considered a “renewable resource,” and therefore is not as reliant on existing supplies of fossil fuels

Even though this application requires significantly higher up-front costs, it has several advantages over conventional HVAC systems such as substantially lower operating and maintenance costs. The life span of the system is longer than conventional heating and cooling systems. Most loop fields are warranted for 25 to 50 years and are expected to last at least 50 to 100 years. However it is important to note that geothermal systems are more difficult to install in existing facilities and require higher capital cost due to having to complete significant infrastructure changes.

The Borough Hall may be a potential candidate for ground source heat pumps, because there is an existing hot water system that may be used to bring ground-loop water to water source heat pumps. Depending on required flows, this may eliminate the need to run piping through the building, which drastically reduces initial construction costs.

All estimates for ground source heat pump systems are based on assumed soil and ground conditions. Test boring would need to be performed to confirm the adequacy of the ground conditions for a ground source heat pump system.

Figure 4.3-1 shows the predicted electricity usage resulting from implementation of a GSHP system. The water source heat pumps that would supply building heat in lieu of the boiler system will require more electricity in the winter. Therefore, a GSHP system may result in increased electricity usage and decreased natural gas usage.

Figure 4.3-1: Borough Hall GSHP Electricity Usage

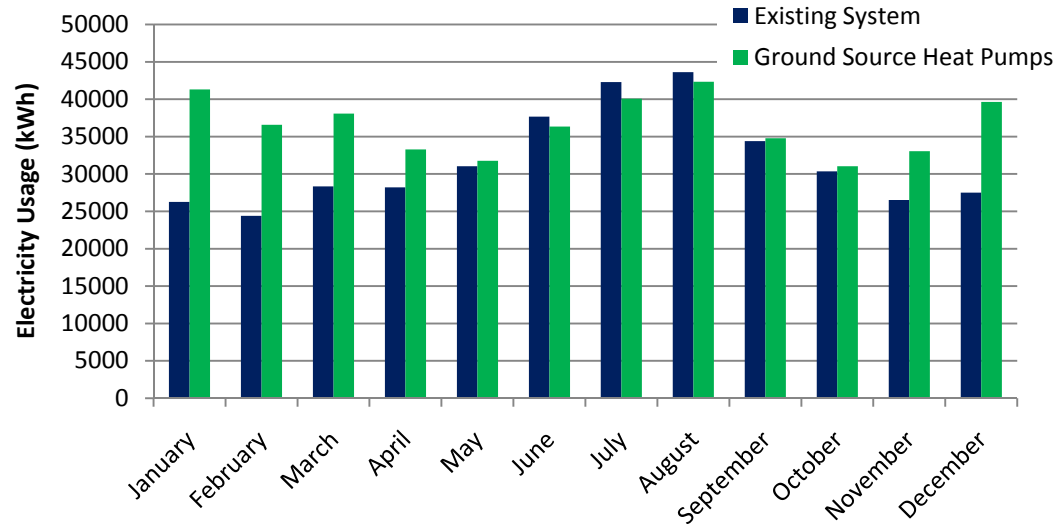


Table 4.3-3 demonstrates the potential payback from implementation of a ground source heat pump (GSHP) system to replace the nine main air handling units in the building.

Table 4.3-3: Borough Hall GSHP System Payback	
Predicted Annual Savings (Therms)	9,669
Annual Savings (Natural Gas)	\$14,697
Predicted Annual Savings (kWh)	(57,630)
Annual Savings (Electricity)	(\$8,558)
Total Annual Savings	\$6,139
Initial Capital Cost of Upgrade	\$688,706
Incentives**	\$29,970
Cost of Upgrade	\$658,736
Annual Maintenance Cost Savings (AMCS)	\$0
Simple Payback	107.3
Lifetime Energy Savings (19 years)*	\$120,737
Annual Return on Investment (AROI)	(4.33%)
Internal Rate of Return (IRR)	(16.03%)
Net Present Value (NPV)	(\$545,492)

*Assumes 2% yearly inflation on natural gas costs, 3% inflation on electricity costs

**Incentives at \$370 per ton, 81 total system tons

Due to the high initial capital cost associated with a switch to ground source heat pump system, CDM recommends against pursuing this implementation at the Borough Hall at this time.

The Library is also a potential candidate for ground source heat pumps, because there is an existing hot water system that may be used to bring ground-loop water to water source heat pumps. Depending on required flows, this may eliminate the need to run piping through the building, which drastically reduces initial construction costs.

Figure 4.3-2 shows the predicted electricity usage resulting from implementation of a GSHP system. The water source heat pumps that would supply building heat in lieu of the boiler system will require more electricity in the winter. Therefore, a GSHP system may result in increased electricity usage and decreased natural gas usage.

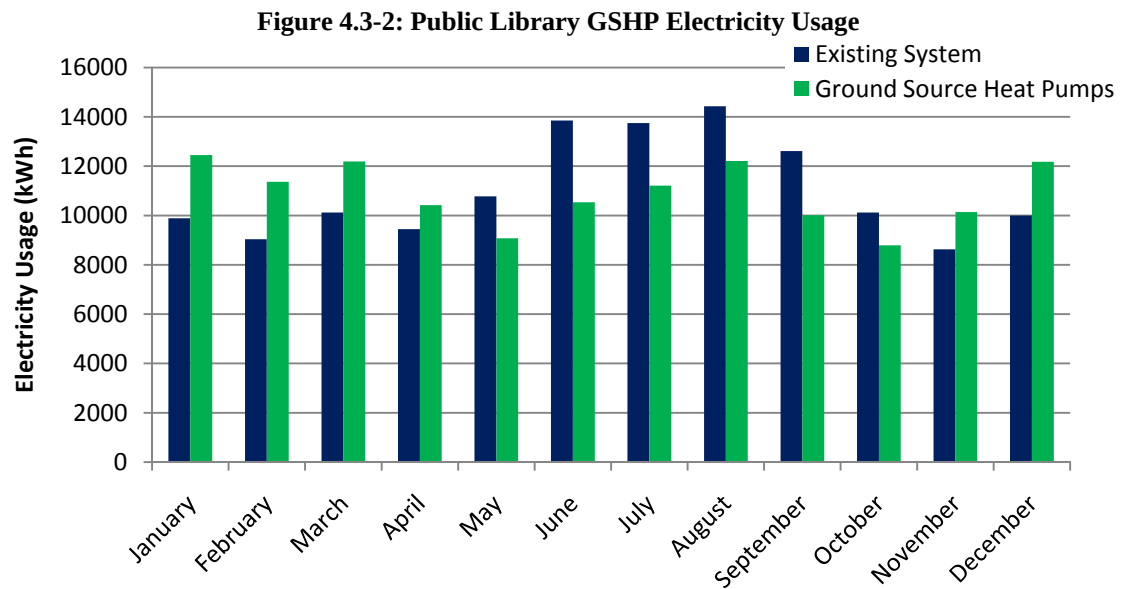


Table 4.3-4 demonstrates the potential payback from implementation of a ground source heat pump (GSHP) system to replace the four main air handling units in the building. The basement areas heated by hot water unit heaters remain unaffected under this recommendation evaluation.

Table 4.3-4: Public Library GSHP System Payback	
Predicted Annual Savings (Therms)	4,966
Annual Savings (Natural Gas)	\$6,108
Predicted Annual Savings (kWh)	4,640
Annual Savings (Electricity)	\$857
Total Annual Savings	\$6,965
Initial Capital Cost of Upgrade	\$413,218
Incentives**	\$17,020
Cost of Upgrade	\$396,198

Table 4.3-4: Public Library GSHP System Payback	
Annual Maintenance Cost Savings (AMCS)	\$0
Simple Payback	56.9
Lifetime Energy Savings (19 years)*	\$161,035
Annual Return on Investment (AROI)	(3.51%)
Internal Rate of Return (IRR)	(6.66%)
Net Present Value (NPV)	(\$267,717)

*Assumes 2% yearly inflation on natural gas costs, 3% inflation on electricity costs

**Incentives at \$370 per ton, 46 total system tons

Due to the high initial capital cost associated with a switch to ground source heat pump system, CDM recommends against pursuing this implementation at the Public Library at this time.

The DPW garages are not good candidates for GSHP systems. These buildings do not have existing water infrastructure, and they require very little cooling. GSHP systems are best-suited for buildings with similar heating and cooling loads, such as office buildings. Therefore, CDM recommends against pursuing GSHP systems at these facilities.

The Fire Department does not have an existing water heating or cooling system. The cost to install the infrastructure needed to operate a GSHP system at this facility would be significant. Therefore, CDM recommends against pursuing a GSHP system at this facility.

4.3.3 On-Site Wind Power Generation

On-site wind power generation typically utilizes a form of turbine, which is rotated with the flow of wind across it, this rotational force powers a generator, producing DC electricity. The DC electricity is then converted into AC electricity, which can be used for commercial power, or can be fed back into the power grid, reducing the overall electric demand. The size of the turbine is proportional to the amount of wind and concurrently the amount of energy it can produce. An ideal location for a wind turbine is 20 feet above any surrounding object within a 250 foot radius. In general this relates to a property size of one acre or more.

CDM has determined that it is feasible for the Borough of Westwood to install a wind turbine energy system on the DPW grounds. A wind turbine energy system would not be viable for the other municipal buildings as the available ground space required for a wind turbine is either paved, or limited in available area. For the purpose of this feasibility analysis, CDM's recommended payback is for a 1-10KW wind turbine. Depending on area available, and funding, the Borough may choose to install more than 1 wind turbine on the premises.

Utilizing NASA's online wind mapping tool, it was determined that the local average wind speeds at the DPW Grounds ranged from 8.52mph to 12.35mph at 100ft, or

3.81m/s to 5.52m/s at 30m. In general, around 9mph of average wind speed, as determined over the course of a year, is necessary to “fuel” the turbine. These values fall within the range of feasibility for installation of a new wind turbine system.

For the purposes of this feasibility analysis, CDM chose a 10KW Bergey wind turbine. This turbine size is used most often for small commercial applications. Power Curve data was determined through the use of the product specification sheets on vendor websites, and vendor provided tools. Actual turbine size, height, location, and manufacturer should be determined upon design of a wind turbine system.

The estimated wind speed data, associated wind probability distribution function (weibull value), turbulence losses, and other relevant data were then incorporated into Bergey’s Wind Cad program to estimate the annual output for the wind turbine. Refer to Appendix J for Wind Cad Modeling.

In order to determine simple payback analysis of the proposed wind turbine, CDM used the vendor pricing information located on the Bergey Wind Turbine website (www.bergey.com), for more information on wind turbine cost estimation refer to Appendix G. By installing the proposed wind turbine, Westwood will offset between \$846.10 and \$2,401.6 per year in utility costs based on the minimum and maximum average local wind speeds. In addition, Renewable Energy Credits (REC’s) are obtainable for renewable power and incentives are available through the Renewable Energy Incentive Program (REIP); refer to Section 7 for a more in depth explanation.

This simple payback calculation takes into account the incentive provided for wind turbines through the REIP program. For the first 16,000 kWh of production, the incentive is \$3.20/kWh. For production between 16,000 kWh – 750,000 kWh the REIP program incentive is \$0.50/kWh. CDM used this incentive as an upfront deduction from the Engineer’s Opinion of Probable Cost. In addition, in order to benefit from the REIP incentive, the Borough must purchase a wind turbine on the approved NJ Clean Energy list. CDM chose the Bergey wind turbine for this analysis as it is approved by the NJ Clean Energy program and is the appropriate size for smaller commercial installations. Refer to the NJ Clean Energy website for more information.

Table 4.3-5 includes a simple payback analysis for the installation of a wind turbine energy system on the DPW grounds. Refer to Appendix K for a more detailed wind turbine financing spreadsheet, including utility cost avoidance and REC’s.

Table 4.3-5: Simple Payback Analysis for Wind Turbine Energy System			
Parameter	Wind Turbine (Minimum Site Wind Speed – 8.5 mph)	Wind Turbine (Maximum Site Wind Speed – 12.4 mph)	Wind Turbine (Average Site Wind Speed – 10.6 mph)
Engineer’s Opinion of Probable Cost	\$68,489.69	\$68,489.69	\$68,489.69
Renewable Energy Incentive Program**	-\$18,256	-\$51,297	-\$34,083

Table 4.3-5: Simple Payback Analysis for Wind Turbine Energy System			
Parameter	Wind Turbine (Minimum Site Wind Speed – 8.5 mph)	Wind Turbine (Maximum Site Wind Speed – 12.4 mph)	Wind Turbine (Average Site Wind Speed – 10.6 mph)
Total Cost	\$50,233.69	\$17,192.69	\$34,406.69
1 st Year Production	5,705 kWh	16,194 kWh	10,651 kWh
Annual Estimated Electric Savings	\$846.10	\$2,401.60	\$1,579.5
Annual Estimated REC Revenue	\$143.00	\$405.00	\$266
Project Simple Payback	50.8 Years	6.1 Years	18.6 Years
Annual Return On Investment (ARO I)	-2.0%	12.3%	1.4%
Lifetime Energy Savings (15 years)**	\$30,848.18	\$87,560.57	\$57,587.41
Internal Rate of Return (IRR)	-2.9%	18.0%	4.4%
Net Present Value (NPV)	-\$28,527	\$44,424	\$6,120

*Refer to Appendix J for Wind Cad Modeling

**REIP incentive is calculated for only the first year and is applied as a deduction.

Based on the simple payback model, summarized in Table 4.3-5, it would benefit the Borough to further investigate the installation of a wind energy system for the DPW Grounds. This is primarily based on the initial upfront capital investment required for a wind turbine energy system installation and the 18.6 year average wind speed payback period. This payback period justifies installing the wind turbine energy system. Other options such as Power Purchase Agreements are potentially available as well to help finance the project. This technology is constantly changing and will most likely continue to lower in price.

For further wind analysis, a tool used to assess the wind potential prior to installing a wind turbine is an anemometer. The Anemometer Load Program is provided by the state that allows potential owners to assess their local wind capacity by borrowing anemometers from New Jersey Colleges and Universities. For more information please see Section 7.

It should be noted that CDM used only REC values, utility cost avoidance factors, and the REIP incentive in determining simple payback periods. As stated above, other incentives and financial programs such as Power Purchase Agreements are available to help finance this installation. For example, if a Power Purchase Agreement is completed, the private company financing the project would benefit from the 30% tax credit. Other incentives such as CREB's and first year usage incentives could be available to the Authority in lowering the payback period. Refer to www.dsireusa.org for an extensive listing of possible incentives for the New Jersey area.

It should also be noted that the wind turbine represented above is for feasibility purposes only. If the Authority decides to install a wind turbine, different mounting

heights, turbine sizes, and manufacturers should be considered. In addition, permits may be required for installation according to local zoning laws. The FAA must also be notified in order to give clearance for the tower, and for installation of aviation safety lights if necessary.

4.3.4 Hydro-Electric Energy

Presently, the Borough of Westwood in conjunction with a local resident and college professor is investigating the utilization of water as an alternative energy source through the use of a turbine. Water power is the combination of head and flow. In a typical hydro system, water is diverted from a stream or reservoir into a pipeline called a penstock, where it is conveyed downhill and through a turbine. The vertical drop or static elevation (head) creates pressure at the bottom end of the penstock. The pressurized water emerging from the end of the penstock creates the force that drives the turbine. More flow or more head increases the potential power that can be generated.

As an alternative energy source, the installation of a hydro-electric system will reduce the Borough's overall carbon footprint. The implementation of a hydro-electric system will work to reduce carbon emissions, reduce the demand on the electric power grid and reduce the dependence on fossil fuel sources for the production of electricity. CDM encourages the Borough to continue pursuing the investigation and future implementation of a hydro-electric system as a viable source of alternative energy.

4.4 Additional Measures

It may be possible to reduce the plug load of the facilities even further with the implementation of smart strips and energy star appliances. Smart Strips save energy by electronically unplugging all of the devices that are plugged into the "Automatically Switched outlets" when the device plugged into the control outlet is turned off. It is important to note that CDM is not suggesting that computers be plugged into the automatically switched off outlets, as there would be potential for the computers to be shut off mid-operation. There are a vast amount of computer peripherals that are typically left on after a computer is shut off, including monitors, scanners, printers and DSL/Cable modems. These peripherals can be plugged into the automatic outlets.

A standard Smart Strip has one 'control' outlet, six (6) outlets that are automatically switched off when the control device is and three (3) outlets that are always hot. An example of how the Borough can implement the use of Smart Strips office or library settings is to plug a computer into the control outlet, five (5) monitors and a personal printer (8 W in standby mode) into the automatic outlets and three (3) computers into the always hot outlets. An LCD monitor can use up to 34W; in standby mode the monitor utilizes 1 – 2W. A CRT monitor typically utilizes around 75W. The following table 4.4-1 summarizes the payback of a Smart Strip, assuming 5 LCD monitors and 1 printer are automatically powered down that would otherwise been left on 8 hours/day and in standby mode 16 hours/day, 5 days/week for 9 months.

Table 4.4-1: Simple Payback

Smart Strip Application Example	
Predicted Annual Savings – 5 LCD monitors, 1 printer (kWh)	611
*Total Annual Savings	\$91
Initial Capital Cost	\$40
Simple Payback (months)	5.3
Lifetime Energy Savings (15 years)	\$1,693

*Aggregate Cost of \$.1485/kWh taken from the Borough Hall

The following Table 4.4-2 summarizes other applications for the Smart Strip that may be applicable throughout the buildings:

Table 4.4-2 Applications for Smart Strips

Control Outlet	Switched Outlets
Computer	Monitors, printers, scanners, lamps
TV	VCR, DVD player, cable box
Lamp	Stereo, space heater

The Borough should continue to implement Energy Star appliances. This is recommended on an 'as-needed' basis.

In addition to replacing old appliances with Energy Star appliances, the following two maintenance procedures can work to save the energy consumed by the refrigerators. One is cleaning dirty condenser coils, twice a year. A refrigerator's condenser coils and cooling fins are located either under the unit behind a grille in the front or on the back of the appliance. The coils can be cleaned with a brush or vacuum cleaner hose. The second source of wasted energy associated with a refrigerator is the door seal. Realigning the door or replacing a no longer airtight door seal will work to improve energy efficiency.

4.4.1 Water Systems

As a result of the National Energy Policy Act water use standards for commercial plumbing products were established. The standards required that toilets use no more than 1.6 gallons per flush, urinals were limited to 1 gallon per flush and faucets and shower heads were allowed a maximum flow of 1.5 gallons per minute (gpm) at 80 psi. Prior to the National Energy Policy Act, originally passed in 1992, standard toilets used 3.5 – 5.5 gallons per flush, urinals required 2 to 3 gallons per flush and standard lavatory faucets has flow rates of 2.5 to 5 gpm.

Appendix M presents a compiled inventory of the water fixtures per building and assumptions made to determine existing monthly water consumption and the water and cost savings that would result from the installation of new low flow toilets and urinals and retrofitting the existing faucets with low flow aerators.

In general, replacement of the water fixtures results in a 40 – 50% reduction in water consumption. Water is currently available to customers at low rates, specifically for United Water customers in New Jersey water consumption is charged at \$4.40/1,000 gallons of water used.

Although these water savings retrofits are a sustainable solution, benefiting society as a whole, the associated cost savings are minimal when compared to the investments, resulting in generally unattractive paybacks. Tables 4.4-3, 4.4-4, 4.4-5, and 4.4-6 demonstrate the anticipated savings and simple paybacks associated with these measures. No maintenance cost savings are anticipated with this measure. Additionally, no incentives were found to offset the cost of implementing automatic sensors and flushometers.

Table 4.4-3: Borough Hall Water Fixtures Payback	
Predicted Annual Savings (Gallons of Water)	110,040
Annual Savings	\$484
Initial Capital Cost of Upgrade	\$21,090
Incentives	\$0
Cost of Upgrade	\$21,090
Annual Maintenance Cost Savings (AMCS)	\$0
Simple Payback	43.6
Lifetime Energy Savings (15 years)*	\$9,002
Annual Return on Investment (AROI)	(4.37%)
Internal Rate of Return (IRR)	(8.69%)
Net Present Value (NPV)	(\$14,041)

Table 4.4-4: Public Library Water Fixtures Payback	
Predicted Annual Savings (Gallons of Water)	12,972
Annual Savings	\$57
Initial Capital Cost of Upgrade	\$6,584
Incentives	\$0
Cost of Upgrade	\$6,584
Annual Maintenance Cost Savings (AMCS)	\$0
Simple Payback	115.5
Lifetime Energy Savings (15 years)*	\$1,060

Table 4.4-4: Public Library Water Fixtures Payback	
Annual Return on Investment (AROI)	(5.80%)
Internal Rate of Return (IRR)	(16.57%)
Net Present Value (NPV)	(\$5,754)

Table 4.4-5: DPW Garages Water Fixtures Payback	
Predicted Annual Savings (Gallons of Water)	20,394
Annual Savings	\$90
Initial Capital Cost of Upgrade	\$8,555
Incentives	\$0
Cost of Upgrade	\$8,555
Annual Maintenance Cost Savings (AMCS)	\$0
Simple Payback	95.1
Lifetime Energy Savings (15 years)*	\$1,674
Annual Return on Investment (AROI)	(5.61%)
Internal Rate of Return (IRR)	(15.12%)
Net Present Value (NPV)	(\$7,244)

Table 4.4-6: Fire Department Water Fixtures Payback	
Predicted Annual Savings (Gallons of Water)	1,854
Annual Savings	\$8
Initial Capital Cost of Upgrade	\$17,758
Incentives	\$0
Cost of Upgrade	\$17,758
Annual Maintenance Cost Savings (AMCS)	\$0
Simple Payback	2,220
Lifetime Energy Savings (15 years)*	\$149
Annual Return on Investment (AROI)	(6.62%)
Internal Rate of Return (IRR)	(34.18%)
Net Present Value (NPV)	(\$17,642)

Section 5

Evaluation of Energy Purchasing and Procurement Strategies

5.1 Energy Deregulation

In 1999, New Jersey State Legislature passed the Electric Discount & Energy Competition Act (EDECA) to restructure the electric power industry in New Jersey. This law, the deregulation of the market, allowed all consumers to shop for their electric supplier. The intent was to create a competitive market for electrical energy supply. As a result, utilities were allowed to charge Cost of Service and customers were given the ability to choose a third party supplier. Energy deregulation in New Jersey increased the energy buyers' options by separating the function of electricity distribution from that of electricity supply.

To sell electric generation service in New Jersey, electric power suppliers must be licensed by the New Jersey Board of Public Utilities (NJ BPU). They must also be registered with the local public utility (PSE&G) to sell electric service in that utility's service areas. The following suppliers are licensed with the NJ BPU and are registered to sell electric service in the PSE&G service territory:

- Amerada Hess Corp
- BOC Energy Services
- Con Edison Solutions, Inc.
- Constellation New Energy, Inc.
- Direct Energy, LLC.
- First Energy Solutions Corp.
- Glacial Energy
- Integrys Energy Service
- Liberty Power
- Pepco Energy Services, Inc.
- PP&L Energy Plus, LLC.
- Reliant Energy Solutions East, LLC.
- Sempra Energy Solutions
- South Jersey Energy
- Strategic Energy LLC
- Suez Energy Resources NA, Inc
- UGI Energy Services

5.1.1 Alternate Third Party Electrical Energy Supplier

In evaluating the potential for an alternative third party supplier, CDM contacted and requested a proposal for electrical service from Glacial Energy. The objective of which was to get an overall idea of whether or not switching electric energy suppliers is an avenue that should be pursued further to obtain electrical energy cost savings.

Due to recent changes in the billing process, PSE&G now requires additional information for each account from Glacial Energy before they will help Glacial generate a comparative quote. This information can be found on the most recent bills as the Point of Delivery (POD) number, which is used to identify PSE&G customers to third party suppliers that participate in the Clean Power Choice program.

The utility bills received by CDM for the accounts at the Fire Department, Borough Hall, and DPW Garages were not recent enough to include a POD number. Glacial Energy was therefore not able to supply a quote for these accounts. However, it should be noted that quotes obtained for similar studies have indicated an 11-12% savings from switching to an alternative third party energy supplier.

For the Library account, Glacial Energy has proposed a flat rate retail cost per kWh over the next 6 or 12 month period. The proposal is included in Appendix L.

The following table, Table 5.1-1, summarizes the annual cost savings available based on historical energy consumption and the proposed energy rate for a 12 month term. The retail rates used in this analysis represent the baseline generation rates from the two suppliers and do not include any applicable demand charges, societal benefits charges, transmission charges, energy charges, reconciliation charges, transitional assessment charges or system control charges that were included in the aggregate rates presented in Section 3. These baseline generation rates, are used for comparison purposes to identify any potential energy cost savings, as all other applicable charges cannot be avoided by switching suppliers. This summary table, which utilizes the historical electrical energy usage presented in Appendix A, confirms the information and available cost savings presented by Glacial Energy.

Table 5.1-1: Potential Energy Cost Savings with an Alternate Third Party Supplier - Glacial Energy

Service Location	Annual Consumption (kWh)	Projected Annual Cost with PSE&G(@ \$0.13035/kWh)	Proposed Annual Cost with Glacial Energy (@ \$0.10882/kWh)	Potential Annual Savings (\$)
Westwood Free Public Library	127,979	\$16,682	\$13,926	\$2,755
Total Potential Annual Savings:				\$2,755

As energy cost savings are available by switching to a third party supplier, such as Glacial Energy, this is a recommended energy cost savings measure. The estimated annual cost savings available by switching to Glacial Energy is a 17% savings. CDM recommends that the Borough investigate this cost savings opportunity further and

compare proposals from alternate third party suppliers to obtain the lowest electrical energy rates available.

5.2 Demand Response Program

Demand Response is a program through which a business can make money on reducing their electricity use when wholesale electricity prices are high or when heavy demand causes instability on the electric grid, which can result in voltage fluctuations or grid failure. Demand Response is an energy management program that compensates the participant for reducing their energy consumption at critical times. Demand Response is a highly efficient and cost effective means of reducing the potential for electrical grid failure and price volatility and is one of the best solutions to the Mid-Atlantic region's current energy challenges.

The program provides at least 2 hours advance notice before curtailment is required. There is typically 1 event a year that lasts about 3 hours in the summer months, when demand for electricity is at its highest.

Participation in Demand Response is generally done through companies known as Curtailment Service Providers, or CSPs, who are members of PJM Interconnection. There is no cost to enroll in the program and participation is voluntary, for instance, you can choose when you want to participate. In most cases, there is no penalty for declining to reduce your electricity use when you're asked to do so. The event is managed remotely by notifying your staff of the curtailment request and then enacting curtailment through your Building Management System. CSPs will share in a percentage of your savings, which may differ among various CSPs, since there may be costs associated with the hardware and /or software required for participation, so it is recommended that a number of CSPs be contacted to review their offers.

Section 6

Ranking of Energy Conservation and Retrofit Measures (ECRM)

6.1 ECRMs

The main objective of this energy audit is to identify potential Energy Conservation and Retrofit Measures and to determine whether or not the identified ECRM's are economically feasible to warrant the cost for planning and implementation of each measure. Economic feasibility of each identified measure was evaluated through a simple payback analysis. The simple payback analysis consists of establishing the Engineer's Opinion of Probable Construction Cost estimates; O&M cost savings estimates, projected annual energy savings estimates and the potential value of New Jersey Clean Energy Rebates or Renewable Energy Credits, if applicable. The simple payback period is then determined as the amount of time (years) until the energy savings associated with each measure amounts to the capital investment cost.

As discussed in Section 3, aggregate unit costs for electrical energy delivery and usage and natural gas delivery and usage, which accounts for all demand and tariff charges at each complex, was determined and utilized in the simple payback analyses.

In general, ECRMs having a payback period of 20 years or less have been recommended and only those recommended ECRMs within Section 4 of the report have been ranked for possible implementation. The most attractive rankings are those with the lowest simple payback period.

Ranking of ECRMs has been broken down into the following categories:

- Lighting Systems
- HVAC Systems
- Solar Systems
- Wind Systems

6.1.1 Lighting Systems

Table 6.1-1 includes the recommended ECRMs to provide energy savings for all building lighting systems, which include the installation of energy-efficient luminaires and occupancy sensors. A detailed discussion on building lighting systems is presented in Section 4.1.

Table 6.1-1 Ranking of Energy Savings Measures Summary – Lighting System Retrofits					
Complex	Retrofit Cost	Incentives	Total Cost	Annual Fiscal Savings	Simple Payback (Years)
Public Library	\$32,482.47	\$2,211	\$30,271.47	\$5,335.72	5.7
DPW Main Building	\$18,967.09	\$1,330	\$17,637.09	\$2,813.29	6.3
Borough Hall	\$94,031.91	\$5,070	\$88,961.91	\$9,455.76	9.4
DPW Garage	\$4,638.82	\$284	\$4,354.82	\$430.61	10.1
Fire Department	\$21,503.56	\$1,730	\$19,773.56	\$1,766.64	11.2

6.1.2 HVAC Systems

Table 6.1-2 includes the recommended ECRM to provide energy savings for building HVAC systems, which provide a simple payback of less than 20 years. A detailed discussion on building HVAC systems is presented in Section 4.4.

Table 6.1-2 Ranking of Energy Savings Measures Summary – HVAC System Upgrade					
Building Measure	Retrofit Cost	Incentives	Total Cost	Annual Fiscal Savings	Simple Payback (Years)
Borough Hall DDC BMS	\$25,685	\$0	\$25,685	\$2,737	9.4
Public Library Boiler Upgrade	\$32,122	\$1,552	\$30,570	\$1,353	10.7
Borough Hall Boiler Upgrade	\$67,628	\$2,000	\$65,628	\$3,964	12.0
Public Library DDC BMS	\$13,800	\$0	\$13,800	\$826	16.7

6.1.3 Solar Energy

Implementation of new solar energy systems has been evaluated to determine the economic feasibility for furnishing and installing such systems. Based on the simple payback modeling performed, it would benefit the Borough to further investigate installing the solar energy systems. This is primarily based on the initial upfront capital investment required for a solar energy system installation and an acceptable payback period. Table 6.1-3, includes a ranking of the solar energy ECRMs evaluated for the Borough.

Table 6.1-3 Ranking of Energy Savings Measures Summary – Solar Energy Systems				
Building & Measure	Retrofit Cost	Annual SREC Credit	Annual Fiscal Savings	Simple Payback (Years)
DPW Main Building - PV Solar System	\$743,975	\$44,630	\$9,805.3	13.7
Borough Hall - PV Solar System	\$510,425	\$27,790	\$6,113.7	15.1
Public Library - PV Solar System	\$314,450	\$13,660	\$3,735.8	18.1

6.1.4 Wind Energy

Implementation of new wind energy systems has been evaluated to determine the economic feasibility for furnishing and installing such systems. Based on the simple payback modeling performed, it would benefit the Borough to further investigate installing the wind energy systems. This is primarily based on the initial upfront capital investment required for a wind energy system installation and an acceptable payback period. Table 6.1-4, includes a ranking of the wind energy ECRMs evaluated for the Borough.

Table 6.1-4: Ranking of Energy Savings Measures Summary – Wind Turbine Energy System			
Parameter	Wind Turbine (Minimum Site Wind Speed – 8.5 mph)	Wind Turbine (Maximum Site Wind Speed – 12.4 mph)	Wind Turbine (Average Site Wind Speed – 10.6 mph)
Engineer's Opinion of Probable Cost	\$68,489.69	\$68,489.69	\$68,489.69
Renewable Energy Incentive Program	-\$18,256	-\$51,297	-\$34,083
Total Cost	\$50,233.69	\$17,192.69	\$34,406.69
1 st Year Production	5,705 kWh	16,194 kWh	10,651 kWh
Annual Estimated Electric Savings	\$846.10	\$2,401.60	\$1,579.5
Annual Estimated REC Revenue	\$143.00	\$405.00	\$266
Project Simple Payback	50.8 Years	6.1 Years	18.6 Years

Section 7

Grants, Incentives and Funding Sources

7.1 Renewable Energy

7.1.1 Renewable Energy Certificates (NJ BPU)

As part of New Jersey's Renewable Portfolio Standards (RPS), electric suppliers are required to have an annually-increasing percentage of their retail sales generated by renewable energy. Electric suppliers fulfill this obligation by purchasing renewable energy certificates (RECs) from the owners of solar generating systems. One REC is created for every 1,000 kWh (1 MWh) of renewable electricity generated. Although solar systems generate electricity and SRECs in tandem, the two are independent commodities and sold separately. The RPS, and creation of RECs, is intended to provide additional revenue flow and financial support for renewable energy projects in New Jersey. Class I RECs, which include electricity generation from wind, wave, tidal, geothermal and sustainable biomass typically trade at around \$25/MWh. RECs generated from solar electricity, or SRECs, trade at \$550/MWh due to supplemental funding from NJ PBU. The supplemental funding will decrease over time to \$350/MWh.

7.1.2 Clean Energy Solutions Capital Investment Loan/Grant (NJ EDA)

NJ EDA in cooperation with NJ DEP is offering interest-free loans and grants for energy efficiency, combined heat and power (CHP) and renewable energy projects with total project capital equipment costs of at least \$1 million. The interest-free loans are available for up to \$5 million, a portion of which may be issued as a grant. The most recent round was closed as of October 2009, but new CESCO program updates will be posted at www.njeda.com. For additional information, contact CESCO@njeda.com or call 866-534-7789.

7.1.3 Renewable Energy Incentive Program (NJ BPU)

The Renewable Energy Incentive Program (REIP) provides rebates for installing solar, wind, and sustainable biomass systems in [Smart Growth](#) regions. Rebates of \$1.00 per watt are available for solar electricity projects up to 50 kW in capacity. Wind systems can receive rebates up to \$3.20 per expected kWh produced. Sustainable biomass rebates start at \$4.00 per watt installed with a maximum incentive amount of 30 percent of project costs. REIP will give out \$53.25 million in rebates from 2009 - 2012. Project owners must complete the Pay for Performance Program, Direct Install or Local Municipal audit, or the rebate will be reduced by \$0.10 per watt. For more information on REIP, please see www.njcleanenergy.com.

7.1.4 Grid Connected Renewables Program (NJ BPU)

The New Jersey Grid Connected Renewables Program offers competitive incentives for wind and sustainable biomass electricity generation projects larger than 1 Megawatt (MW). Applications for the most recent round of funding, which totaled \$6

million, were due January 8, 2010. Requests for Proposals (RFPs) for the next round will be posted at www.njcleanenergy.com and www.state.nj.us/bpu. A total of roughly \$16 million is available for incentives under this program during 2010. Most of the incentives offered under this program will take the form of a payment for energy production (\$/MWh) once the project is operating. Incentives range up to \$58.49/MWh for publicly-owned wastewater biogas projects. Up to 10% of the incentive may be requested in the form of a lump grant to cover up-front costs such as financing fees, interconnection fees, project design, permitting, and construction costs.

7.1.5 Utility Financing Programs

All four Electric Distribution Companies (EDCs) in New Jersey have developed long term contracting or financing programs for the development of solar energy systems. In all of the programs, Solar Renewable Energy Credits (SRECs) generated by the solar energy systems will be sold at auction to energy suppliers who are required to purchase a certain quantity of SRECs to meet their Renewable Portfolio Standard requirements.

7.1.6 Renewable Energy Manufacturing Incentive (NJ BPU)

New Jersey's Renewable Energy Manufacturing Incentive (REMI) program provides rebates to purchase and install solar panels, inverters, and racking systems manufactured in New Jersey. Rebates for panels start at \$0.25 per watt and rebates for racking systems and inverters start at \$0.15 per watt for solar projects up to 500 kW in capacity. To be eligible for REMI, applicants must apply to either the Renewable Energy Incentive Program (REIP) or the SREC Registration Program (SRP).

7.1.7 Clean Renewable Energy Bonds (IRS)

CREBs are 0% interest bonds typically issued for up to approximately \$3.0 million administered by the Internal Revenue Service (IRS). Last year, \$2.2 billion in CREBs was allocated to municipal entities to fund 610 renewable energy projects, including anaerobic digestion. IRS has been allocating funding for CREBs annually since 2005. Last year, IRS solicited applications starting in April, which were due in August. The IRS is expected to receive additional funding for CREBs and release another round of solicitations in 2010.

7.1.8 Qualified Energy Conservation Bonds (IRS)

These IRS 0% interest bonds are very similar to CREBs except they are allocated based on state and county population. New Jersey was allocated \$90 million as part of the ARRA stimulus fund. QECBs are typically distributed through municipal bond banks or state economic development agencies.

7.1.9 Global Climate Change Mitigation Incentive Fund (US EDA)

The Economic Development Agency (part of the U.S. Department of Commerce) administers the GCCMIF to public works projects that reduce greenhouse gas

emissions and creates new jobs. In FY 2009, \$15 million was allocated to the fund, and additional funding is expected to be allocated in FY 2010. Applications are due on a rolling basis. The program does not have a maximum grant amount but does limit the grant to 50 percent of the project cost.

7.1.10 Private Tax-Exempt Financing

Similar to traditional municipal bond financing, there are many private financial service companies that offer a myriad of options for tax-exempt financing of municipal projects. The providers of these services suggest that this capital can be offered at competitive rates in an expedited timeframe and with fewer complications when compared to traditional municipal financing methods. Though these factors would need to be compared on a case-by-case basis, the one distinct advantage to private financing on the current project would likely be the flexibility to structure payments to meet budget needs with consideration given to the terms and conditions of existing loan and/or bond agreements. For example, this mechanism could be used to limit the initial debt payments when the current bond debt is the greatest and the operations savings of the project has yet to be fully realized. It should also be noted that, in many cases, the construction and long term financing can be rolled into a single private financing agreement. Also, in some instances, equipment manufacturers have the ability to offer competitive financing terms (e.g. Siemens Financial Services Corporation), though financing from these sources is generally contingent upon a substantial portion of the project cost (~20% to 30%) being for their respective equipment.

7.1.11 Performance Based Contracts (ESCOs)

A second financing alternative for a project of this nature would be to enter into a Performance Based Contract with an Energy Services Company (ESCO). The premise of this type of contract is that it requires no initial municipal capital contributions in order to implement the project - instead relying on future operations cost savings and/or energy production, to fund the annual payments. Prior to entering into an agreement for the funding of the project, an ESCO would perform an energy audit and/or conceptual studies to confirm future energy cost savings or energy production inherent with the projects implementation and operation. The contract would then be formulated based on some measurable parameter(s) (sludge reduction, energy production, etc) which would be verified by measurement throughout the contract duration. The savings in energy costs or energy production would then be used to pay back the capital investment of the project over the contract time period (typically on the order of 10-years or less). The ESCO would guarantee the agreed upon energy savings or energy production. If the project does not meet energy savings or production commitments, the ESCO pays the owner the equivalent difference.

With this funding alternative, the ownership and operation of the facility would be maintained by the original owner. A performance contract may also include ESCO operation and maintenance of the energy-related facilities if that were deemed appropriate. Significant ESCO's with experience in this area include Siemens Building

Technologies, Chevron and Johnson Controls. CDM has functioned in several roles on performance based contracts including being the owner's representative and, on different contracts, providing design-build services (as a subcontractor to the ECSO). We can provide additional experience-based information upon request.

7.1.12 Power Purchase Agreements (SPCs)

More commonly referred to as a Build-Own-Transfer (BOT) agreement in the Water/Wastewater industry, a Power Purchase Agreement (PPA) also delivers a project with no initial capital contribution by the original owner. In this model, a Special Purpose Company (SPC) created by a developer, would own the energy production facilities. Within the framework of a PPA, a SPC will typically lease property from the owners for construction and operation of the new facilities. The funding and construction of the new facilities would be performed by the SPC who would then own and operate the facilities for the duration of the contract (typically 20 to 30 years). Throughout that period of time, the original owner would purchase power from the SPC at a pre-negotiated rate which would take into account the initial capital cost, operation and maintenance of the constructed facility, ancillary benefits of the project and investor returns on investment. For renewable energy, financial incentives may enable this financing approach to compete favorably with utility power tariffs. Incentives include state and local tax credits, renewable energy credits, and Federal energy production tax credits or energy investment tax credits. It is expected that a number of experienced companies and developers may be interested in a PPA for New Jersey municipal renewable energy projects.

7.2 Energy Efficiency

7.2.1 Introduction

New Jersey's Clean Energy Program (NJ CEP) promotes increased energy efficiency and the use of clean, renewable sources of energy including solar, wind, geothermal, and sustainable biomass. The results for New Jersey are a stronger economy, less pollution, lower costs, and reduced demand for electricity. NJCEP offers financial incentives, programs, and services for residential, commercial, and municipal customers.

NJCEP reduces the need to generate electricity and burn natural gas which eliminates the pollution that would have been caused by such electric generation or natural gas usage. The benefits of these programs continue for the life of the measures installed, which on average is about 15 years. Thus, the public receives substantial environmental and public health benefits from programs that also lower energy bills and benefit the economy.

7.2.2 New Jersey Smart Start Buildings Program (NJ BPU)

The New Jersey Smart Start Buildings Program offers rebate incentives for several qualifying equipment such as high efficient premium motors and lighting, and lighting controls.

Incentive information and incentive calculation worksheets are provided for the various new equipment installation identified in this report and are included in Appendix G.

7.2.3 Pay for Performance Program (NJ BPU)

Another program offered through the New Jersey Smart Start Program, is the Pay for Performance Program. Commercial, industrial and institutional buildings are eligible for participation if not already receiving Energy Efficiency and Conservation Block Grants.

Incentives are available for buildings that are able to present an Energy Reduction Plans that reduce the building's current energy consumption by 15% or more, in addition to incentives for installing the recommended measures and incentives for presenting the energy savings in a post-construction benchmarking report. No more than 50% of the total energy savings may be derived from lighting retrofits. In addition, the total energy savings of 15% may not come from the implementation of one energy savings measure. The incentive structure is provided in Appendix F.

The recommended ECRM's presented in this report are expected to warrant participation in this program.

7.2.4 Direct Install (NJ BPU)

Owners of existing small to mid-size commercial and industrial facilities with a peak electric demand that did not exceed 200 kW in any of the preceding 12 months are eligible to participate in Direct Install. Buildings must be located in New Jersey and served by one of the state's public, regulated electric or natural gas utility companies.

This program will cover up to 80% of the retro-fitting costs associated with the use of new energy efficient equipment. Lighting, HVAC, refrigeration, motors, natural gas systems, and variable frequency drives are covered under the Direct Install program.

7.2.5 Anemometer Loan Program

The Anemometer Loan Program is funded by a grant provided by the United States DOE Wind Powering America Program and New Jersey's Clean Energy Program, the Office of Clean Energy has partnered with five colleges to implement the New Jersey Anemometer Loan Program, a tool used to assess the wind potential prior to installing small wind generating equipment. For more information regarding this program, click [here](#) or email alma.rivera@bpu.state.nj.us or call 973-648-7405. The selected institution delivers and administers the anemometer.

APPENDIX A

UTILITY BILL INFORMATION

Electric Bills - Westwood Borough Hall													
Account # 41 815 006 08													
Service From	Service To	Year	Delivery Charges	Supply Charges	PSE&G Electric Charges Meter #: 728013246	KWH	PSE & G Cost Per KWH	Measured Demand KW	Demand Charge	Overall Cost Per kW Demand	Month	Adjusted Monthly Usage KWH	Adjusted Monthly Demand KW
12/28/2007	1/29/2008	2008	\$978.46	\$2,806.94	\$3,785.40	31120.00	\$0.12	65.6	\$3.89	\$0.06	January	29218.00	62.06
1/30/2008	2/27/2008	2008	\$880.21	\$2,555.87	\$3,436.08	27120.00	\$0.13	64.0	\$3.89	\$0.06	February	27055.00	63.59
2/28/2008	3/30/2008	2008	\$920.87	\$2,633.60	\$3,554.47	28880.00	\$0.12	64.0	\$3.89	\$0.06	March	27966.00	62.76
3/31/2008	4/28/2008	2008	\$912.93	\$2,321.01	\$3,233.94	25840.00	\$0.13	80.0	\$3.89	\$0.05	April	26730.00	83.11
4/29/2008	5/28/2008	2008	\$964.42	\$2,434.48	\$3,398.90	26720.00	\$0.13	88.0	\$3.89	\$0.04	May	28853.00	95.37
5/29/2008	6/26/2008	2008	\$2,526.60	\$4,457.61	\$6,984.21	37840.00	\$0.18	128.0	\$3.89	\$0.03	June	39269.00	127.36
6/27/2008	7/29/2008	2008	\$2,440.92	\$5,329.77	\$7,770.69	44080.00	\$0.18	104.0	\$3.89	\$0.04	July	41203.00	97.90
7/30/2008	8/27/2008	2008	\$2,137.03	\$4,609.01	\$6,746.04	35760.00	\$0.19	94.4	\$3.89	\$0.04	August	37720.00	101.76
8/28/2008	9/26/2008	2008	\$2,124.96	\$4,096.02	\$6,220.98	33200.00	\$0.19	104.0	\$3.89	\$0.04	September	32379.00	101.33
9/27/2008	10/26/2008	2008	\$956.45	\$2,836.97	\$3,793.42	27040.00	\$0.14	84.0	\$3.89	\$0.05	October	28014.00	85.21
10/27/2008	11/24/2008	2008	\$915.10	\$2,665.24	\$3,580.34	26560.00	\$0.13	72.0	\$3.89	\$0.05	November	27492.00	71.17
11/25/2008	12/23/2008	2008	\$886.34	\$2,599.75	\$3,486.09	26640.00	\$0.13	56.0	\$3.89	\$0.07	December	28420.00	60.41
12/24/2008	1/20/2009	2009	\$890.48	\$2,606.76	\$3,497.24	25520.00	\$0.14	56.0	\$3.89	\$0.07	January	28286.00	62.00
1/21/2009	2/17/2009	2009	\$895.05	\$2,771.93	\$3,666.98	25600.00	\$0.14	56.0	\$3.89	\$0.07	February	24962.00	56.81
2/18/2009	3/16/2009	2009	\$829.86	\$2,530.68	\$3,360.54	23120.00	\$0.15	56.0	\$3.89	\$0.07			

Month	Average (KWH)	Demand (KW)
January	28752	62
February	26009	60
March	27966	63
April	26730	83
May	28853	95
June	39269	127
July	41203	98
August	37720	102
September	32379	101
October	28014	85
November	27492	71
December	28420	60

Natural Gas Bills										
Westwood Gas Account # 41 815 006 08 : Borough Hall										
Service From	Service To	Year	Meter #: 3355385	Delivery Charge	Supply Charge	Total Charge	PSE&G Gas Usage	Cost/Therm	Month	Adjusted Monthly Usage
12/28/2007	1/29/2008	2008	2124.31	\$845.91	\$2,093.10	\$2,939.01	\$2,939.01	\$1.38	January	1998.00
1/30/2008	2/27/2008	2008	1900.22	\$757.81	\$2,042.35	\$2,800.16	\$2,800.16	\$1.47	February	1857.00
2/28/2008	3/30/2008	2008	1412.73	\$564.31	\$1,668.30	\$2,232.61	\$2,232.61	\$1.58	March	1335.00
3/31/2008	4/28/2008	2008	314.06	\$104.15	\$394.04	\$498.19	\$498.19	\$1.59	April	307.00
4/29/2008	5/28/2008	2008	56.29	\$26.82	\$80.54	\$107.36	\$107.36	\$1.91	May	57.00
5/29/2008	6/26/2008	2008	47.95	\$24.32	\$72.13	\$96.45	\$96.45	\$2.01	June	49.00
6/27/2008	7/29/2008	2008	51.22	\$25.30	\$83.58	\$108.88	\$108.88	\$2.13	July	48.00
7/30/2008	8/27/2008	2008	42.99	\$22.82	\$52.39	\$75.21	\$75.21	\$1.75	August	46.00
8/28/2008	9/26/2008	2008	42.90	\$22.80	\$48.45	\$71.25	\$71.25	\$1.37	September	70.00
9/27/2008	10/26/2008	2008	242.53	\$82.85	\$249.09	\$331.94	\$331.94	\$1.34	October	397.00
10/27/2008	11/24/2008	2008	1084.08	\$440.43	\$1,009.56	\$1,449.99	\$1,449.99	\$1.34	November	1274.00
11/25/2008	12/23/2008	2008	1823.49	\$742.19	\$1,747.60	\$2,489.79	\$2,489.79	\$1.37	December	2088.00
12/24/2008	1/20/2009	2009	2245.43	\$918.61	\$2,040.13	\$2,958.74	\$2,958.74	\$1.32	January	2426.00
1/21/2009	2/17/2009	2009	2092.82	\$856.78	\$1,622.25	\$2,479.03	\$2,479.03	\$1.18	February	1889.00
2/18/2009	3/16/2009	2009	1517.29	\$622.90	\$1,034.94	\$1,657.84	\$1,657.84	\$1.09		

Month	Average Therm Usage
January	2,212
February	1,873
March	1,335
April	307
May	57
June	49
July	48
August	46
September	70
October	397
November	1,274
December	2,088

Electric Bills - Westwood Public Library													
Account # 41 775 310 06/65 241 997 07													
Service From	To	Year	Delivery Charges	Supply Charges	PSE&G Electric Charges Meter #: 678004708	KWH	PSE & G Cost Per KWH	Measured Demand KW	Demand Charge	Overall Cost Per kW Demand	Month	Adjusted Monthly Usage KWH	Adjusted Monthly Demand KW
12/29/2007	1/28/2007	2008	\$ 376.89	\$ 999.00	\$1,375.89	10470.00	\$0.13	33.6	\$3.89	\$0.12	January	10474.00	33.83
1/29/2008	2/27/2008	2008	\$ 374.78	\$ 1,006.18	\$1,380.96	10170.00	\$0.14	34.8	\$3.89	\$0.11	February	9857.00	33.62
2/28/2008	3/28/2008	2008	\$ 382.63	\$ 1,015.72	\$1,398.35	10560.00	\$0.13	34.5	\$3.89	\$0.11	March	10820.00	35.05
3/19/2008	4/28/2008	2008	\$ 348.90	\$ 944.97	\$1,293.87	9960.00	\$0.13	29.4	\$3.89	\$0.13	April	9630.00	29.59
4/29/2008	5/28/2008	2008	\$ 401.59	\$ 919.18	\$1,320.77	9510.00	\$0.14	45.6	\$3.89	\$0.09	May	10114.00	48.95
5/29/2008	6/26/2008	2008	\$ 1,039.14	\$ 1,571.29	\$2,610.43	11970.00	\$0.22	61.8	\$3.89	\$0.06	June	12449.00	62.64
6/27/2008	7/28/2008	2008	\$ 1,047.16	\$ 1,848.57	\$2,895.73	13740.00	\$0.21	57.9	\$3.89	\$0.07	July	13280.00	56.38
7/29/2008	8/28/2008	2008	\$ 1,038.74	\$ 1,842.11	\$2,880.85	12990.00	\$0.22	59.1	\$3.89	\$0.07	August	12839.00	59.29
8/29/2008	9/25/2008	2008	\$ 917.81	\$ 1,462.34	\$2,380.15	10320.00	\$0.23	55.2	\$3.89	\$0.07	September	10813.00	55.75
9/26/2008	10/24/2008	2008	\$ 363.97	\$ 1,167.56	\$1,531.53	9270.00	\$0.17	37.5	\$3.89	\$0.10	October	9941.00	39.16
10/25/2008	11/24/2008	2008	\$ 382.99	\$ 1,180.98	\$1,563.97	10050.00	\$0.16	36.0	\$3.89	\$0.11	November	9711.00	35.38
11/25/2008	12/23/2008	2008	\$ 377.47	\$ 1,089.66	\$1,467.13	9330.00	\$0.16	36.3	\$3.89	\$0.11	December	9903.00	38.73
12/24/2008	1/20/2009	2009	\$ 368.99	\$ 1,061.56	\$1,430.55	8760.00	\$0.16	34.8	\$3.89	\$0.11	January	10146.00	39.00
1/21/2009	2/17/2009	2009	\$ 404.60	\$ 1,217.19	\$1,621.79	9900.00	\$0.16	36.0	\$3.89	\$0.11	February	9714.00	35.67
2/18/2009	3/16/2009	2009	\$ 375.13	\$ 1,141.97	\$1,517.10	9090.00	\$0.17	33.90	\$3.89	\$0.11	March	10170.00	34.49
3/17/2009	4/20/2009	2009	\$ 428.35	\$ 1,307.35	\$1,735.70	11160	\$0.16	33.60	\$3.89	\$0.12	April	9813.00	33.04
4/21/2009	5/21/2009	2009	\$ 452.47	\$ 1,248.21	\$1,700.68	10650	\$0.16	42.90	\$3.89	\$0.09	May	10823.00	42.09
5/22/2009	6/25/2009	2009	\$ 922.99	\$ 1,644.11	\$2,567.10	12630	\$0.20	45.60	\$3.89	\$0.09	June	10708.00	41.52
6/26/2009	7/24/2009	2009	\$ 901.42	\$ 1,457.74	\$2,359.16	9780	\$0.24	51.90	\$3.89	\$0.07	July	10912.00	56.91
7/25/2009	5/24/2009	2009	\$ 1,105.99	\$ 1,750.06	\$2,856.05	12480	\$0.23	61.80	\$3.89	\$0.06	August	12087.00	59.09
8/25/2009	9/24/2009	2009	\$ 916.38	\$ 1,532.40	\$2,448.78	10740	\$0.23	49.80	\$3.89	\$0.08	September	10444.00	47.49
9/25/2009	10/23/2009	2009	\$ 450.95	\$ 1,323.77	\$1,774.72	10290	\$0.17	43.20	\$3.89	\$0.09	October	10979.00	43.94
10/24/2009	11/23/2009	2009	\$ 444.91	\$ 1,334.47	\$1,779.38	10920	\$0.16	37.50	\$3.89	\$0.10	November	10290.00	36.29
11/24/2009	12/24/2009	2009	\$ 412.05	\$ 1,229.14	\$1,641.19	9690	\$0.17	37.50	\$3.89	\$0.10	December	7502.00	29.03

Month	Average (KWH)	Demand (KW)
January	10310	36
February	9786	35
March	10495	35
April	9722	31
May	10469	46
June	11579	52
July	12096	57
August	12463	59
September	10629	52
October	10460	42
November	10001	36
December	8703	34

Natural Gas Bills									
Westwood Gas Account # 41 775 310 06/65 241 997 07 : Public Library									
Service From	Service To	Year	Meter #: 3166230	Delivery Charge	Supply Charge	PSE&G Gas Usage	Cost Per Therm	Month	Adjusted Monthly Usage
12/29/2007	1/28/2007	2008	1252.05	\$ 505.71		\$505.71	\$0.40	January	1249.40
1/29/2008	2/27/2008	2008	1185.16	\$ 479.22		\$479.22	\$0.40	February	1121.81
2/28/2008	3/28/2008	2008	827.39	\$ 337.55		\$337.55	\$0.41	March	817.47
3/19/2008	4/28/2008	2008	467.43	\$ 150.17	\$ 583.30	\$733.47	\$1.57	April	432.97
4/29/2008	5/28/2008	2008	161.57	\$ 58.41	\$ 230.19	\$288.60	\$1.79	May	150.79
5/29/2008	6/26/2008	2008	0.00	\$ 9.93		\$9.93		June	0.00
6/27/2008	7/28/2008	2008	0.00	\$ 9.93		\$9.93		July	0.00
7/29/2008	8/28/2008	2008	0.00	\$ 9.93		\$9.93		August	0.00
8/29/2008	9/25/2008	2008	0.00	\$ 9.93		\$9.93	\$1.38	September	35.33
9/26/2008	10/24/2008	2008	204.90	\$ 71.43	\$ 211.99	\$283.42	\$1.36	October	323.63
10/25/2008	11/24/2008	2008	682.26	\$ 283.55	\$ 641.30	\$924.85	\$1.36	November	731.10
11/25/2008	12/23/2008	2008	980.68	\$ 405.85	\$ 938.19	\$1,344.04	\$1.37	December	1112.88
12/24/2008	1/20/2009	2009	1172.84	\$ 486.69	\$ 1,068.87	\$1,555.56	\$1.33	January	1268.57
1/21/2009	2/17/2009	2009	1096.64	\$ 455.83	\$ 857.00	\$1,312.83	\$1.20	February	1014.11
2/18/2009	3/16/2009	2009	854.92	\$ 357.55	\$ 584.63	\$942.18	\$1.10	March	806.50
3/17/2009	4/20/2009	2009	699.74	\$ 227.30	\$ 437.62	\$664.92	\$0.95	April	439.53
4/21/2009	5/21/2009	2009	123.00	\$ 48.63	\$ 70.36	\$118.99	\$0.97	May	119.95
5/22/2009	6/25/2009	2009	128.21	\$ 50.49	\$ 73.17	\$123.66	\$0.96	June	91.58
6/26/2009	7/24/2009	2009	0.00	\$ 10.12		\$10.12		July	0.00
7/25/2009	5/24/2009	2009	0.00	\$ 10.12		\$10.12		August	0.00
8/25/2009	9/24/2009	2009	0.00	\$ 10.12		\$10.12		September	22.21
9/25/2009	10/23/2009	2009	107.36	\$ 44.14	\$ 62.87	\$107.01	\$1.00	October	166.88
10/24/2009	11/23/2009	2009	316.69	\$ 136.28	\$ 209.11	\$345.39	\$1.09	November	454.94
11/24/2009	12/24/2009	2009	974.20	\$ 404.51	\$ 678.70	\$1,083.21	\$1.11		

Month	Average Therm Usage
January	1258.99
February	1067.96
March	811.99
April	436.25
May	135.37
June	45.79
July	0.00
August	0.00
September	28.77
October	245.26
November	593.02
December	933.55

Electric Bills - Westwood Fire Hall											
Account # 41 816 039 03											
Service From	To	Year	PSE&G Electric Charges Meter #: 728011249	KWH	Measured Demand KW	PSE & G Cost Per KWH	Demand Charge	Overall Cost Per kW Demand	Month	Adjusted Monthly Usage KWH	Adjusted Monthly Demand KW
12/29/2007	1/29/2008	2008	\$1,519.08	11,760	37.6	\$0.13	\$3.89	\$0.10	January	11454.83	36.48
1/30/2009	2/28/2009	2008	\$1,575.77	11,960	36.0	\$0.13	\$3.89	\$0.11	February	11162.67	33.60
3/1/2009	3/31/2009	2008	\$1,522.90	11,800	34.8	\$0.13	\$3.89	\$0.11	March	11800.00	34.80
4/1/2009	4/29/2009	2008	\$1,313.21	9,840	40.8	\$0.13	\$3.89	\$0.10	April	10168.00	42.35
4/30/2009	5/29/2009	2008	\$1,349.71	9,840	46.4	\$0.14	\$3.89	\$0.08	May	10425.10	48.41
5/30/2009	6/27/2009	2008	\$2,677.56	13,240	51.6	\$0.20	\$3.89	\$0.08	June	13875.65	52.95
6/28/2009	7/29/2009	2008	\$2,153.52	16,520	52.4	\$0.13	\$3.89	\$0.07	July	15831.94	50.97
7/30/2009	8/27/2009	2008	\$1,769.56	12,480	50.4	\$0.14	\$3.89	\$0.08	August	13235.31	53.69
8/28/2009	9/26/2009	2008	\$2,578.35	12,120	50.8	\$0.21	\$3.89	\$0.08	September	11784.00	49.50
9/27/2009	10/27/2009	2008	\$1,206.67	9,920	42.4	\$0.12	\$3.89	\$0.09	October	9815.17	41.07
10/28/2009	11/25/2009	2008	\$1,028.43	8,520	30.0	\$0.12	\$3.89	\$0.13	November	8750.54	31.00
11/26/2009	12/24/2009	2008	\$1,508.94	9,840	36.0	\$0.15	\$3.89	\$0.11	December	10871.33	40.71
12/25/2008	1/20/2009	2009	\$1,499.31	9,400	38.0	\$0.16	\$3.89	\$0.10	January	10482.96	40.41
1/21/2009	2/17/2009	2009	\$1,472.84	8,960	31.2	\$0.16	\$3.89	\$0.12	February	8911.11	31.33
2/18/2009	3/16/2009	2009	\$1,413.67	8,520	30.4	\$0.17	\$3.89	\$0.13			

Month	Average (KWH)	Demand (KW)
January	10969	38
February	10037	32
March	11800	35
April	10168	42
May	10425	48
June	13876	53
July	15832	51
August	13235	54
September	11784	50
October	9815	41
November	8751	31
December	10871	41

Natural Gas Bills							
Westwood Gas Account # 41 816 039 03 : Fire Hall							
Service From	Service To	Year	Meter #: 3228079	PSE&G Gas Usage	Cost Per Therm	Month	Adjusted Monthly Usage
12/29/2007	1/29/2008	2008	997.464	\$1,382.99	\$1.39	January	965.38
1/30/2008	2/28/2008	2008	921.446	\$1,357.94	\$1.47	February	860.02
3/1/2008	3/31/2008	2008	759.575	\$1,202.94	\$1.58	March	759.58
4/1/2008	4/29/2008	2008	311.968	\$494.96	\$1.59	April	321.14
4/30/2008	5/29/2008	2008	275.183	\$486.23	\$1.77	May	277.87
5/30/2008	6/27/2008	2008	171.989	\$320.25	\$1.86	June	176.79
6/28/2008	7/29/2008	2008	177.717	\$353.16	\$1.99	July	172.20
7/30/2008	8/27/2008	2008	161.459	\$257.60	\$1.60	August	171.67
8/28/2008	9/26/2008	2008	160.1	\$239.19	\$1.49	September	167.48
9/27/2008	10/27/2008	2008	222.669	\$306.23	\$1.38	October	257.01
10/28/2008	11/25/2008	2008	457.28	\$603.61	\$1.32	November	503.27
11/26/2008	12/24/2008	2008	763.445	\$1,034.38	\$1.35	December	890.22
12/25/2008	1/20/2009	2009	909.658	\$1,191.17	\$1.31	January	1028.18
1/21/2009	2/17/2009	2009	902.004	\$1,060.84	\$1.18	February	832.43
2/18/2009	3/16/2009	2009	699.001	\$756.45	\$1.08		

Month	Average Therm Usage
January	996.78
February	846.23
March	759.58
April	321.14
May	277.87
June	176.79
July	172.20
August	171.67
September	167.48
October	257.01
November	503.27
December	890.22

Electric Bills - Westwood DPW Main Building											
Account # 41 774 164 01											
Service From	Service To	Year	PSE&G Electric Charges Meter #: 626004414	KWH	Measured Demand	PSE & G Cost Per KWH	Demand Charge	Overall Cost Per kW Demand	Month	Adjusted Monthly Usage KWH	Adjusted Monthly Demand KW
12/29/2007	1/28/2008	2008	\$1,044.29	8,724	20.00	\$0.12	\$3.89	\$0.19	January	8737.74	19.97
1/29/2008	2/27/2008	2008	\$1,054.17	8,580	19.10	\$0.12	\$3.89	\$0.20	February	8009.59	17.91
2/28/2008	3/28/2008	2008	\$1,014.48	8,340	20.80	\$0.12	\$3.89	\$0.19	March	8568.60	21.70
3/29/2008	4/28/2008	2008	\$660.93	5,334	16.70	\$0.12	\$3.89	\$0.23	April	5072.52	15.92
4/29/2008	5/29/2008	2008	\$503.31	3,948	13.00	\$0.13	\$3.89	\$0.30	May	3987.72	13.13
5/30/2008	6/26/2008	2008	\$782.42	4,122	13.60	\$0.19	\$3.89	\$0.29	June	4508.57	14.25
6/27/2008	7/28/2008	2008	\$984.31	5,448	13.00	\$0.18	\$3.89	\$0.30	July	5250.52	12.80
7/29/2008	8/26/2008	2008	\$909.56	4,674	13.70	\$0.19	\$3.89	\$0.28	August	4891.48	14.45
8/27/2008	9/25/2008	2008	\$809.93	4,206	13.00	\$0.19	\$3.89	\$0.30	September	4201.21	13.24
9/26/2008	10/24/2008	2008	\$593.36	4,038	14.00	\$0.15	\$3.89	\$0.28	October	4838.89	16.04
10/25/2008	11/24/2008	2008	\$886.89	6,630	19.70	\$0.13	\$3.89	\$0.20	November	7017.31	19.22
11/25/2008	12/23/2008	2008	\$1,149.04	9,108	19.20	\$0.13	\$3.89	\$0.20	December	9880.73	21.37
12/24/2008	1/20/2009	2009	\$1,210.29	9,300	21.50	\$0.13	\$3.89	\$0.18	January	10520.36	23.81
1/21/2009	2/17/2009	2009	\$1,330.19	9,870	21.50	\$0.13	\$3.89	\$0.18	February	9695.83	22.50
2/18/2009	3/16/2009	2009	\$1,243.91	9,090	23.20	\$0.14	\$3.89	\$0.17			

Month	Average (KWH)	Demand (KW)
January	9629.05	21.89
February	8852.71	20.21
March	8568.60	21.70
April	5072.52	15.92
May	3987.72	13.13
June	4508.57	14.25
July	5250.52	12.80
August	4891.48	14.45
September	4201.21	13.24
October	4838.89	16.04
November	7017.31	19.22
December	9880.73	21.37

Natural Gas Bills							
Westwood Gas Account # 41 774 164 01 : DPW Main Building							
Service From	Service To	Year	Meter #: 1673518	PSE&G Gas Usage	Cost/The rm	Month	Adjusted Monthly Usage
12/29/2007	1/28/2008	2008	968.249	\$1,347.42	\$1.39	January	969.93
1/29/2008	2/27/2008	2008	953.759	\$1,406.84	\$1.48	February	881.12
2/28/2008	3/28/2008	2008	659.411	\$1,047.27	\$1.59	March	659.49
3/29/2008	4/28/2008	2008	235.802	\$374.93	\$1.59	April	215.54
4/29/2008	5/29/2008	2008	39.61	\$78.27	\$1.98	May	37.05
5/30/2008	6/26/2008	2008	0	\$9.93		June	0.00
6/27/2008	7/28/2008	2008	0	\$9.93		July	0.00
7/29/2008	8/26/2008	2008	0	\$9.93		August	0.35
8/27/2008	9/25/2008	2008	2.093	\$12.94	\$6.18	September	21.57
9/26/2008	10/24/2008	2008	114.99	\$163.42	\$1.42	October	192.98
10/25/2008	11/24/2008	2008	433.213	\$590.82	\$1.36	November	519.06
11/25/2008	12/23/2008	2008	887.726	\$1,217.54	\$1.37	December	1138.45
12/24/2008	1/20/2009	2009	1198.953	\$1,589.91	\$1.33	January	1259.27
1/21/2009	2/17/2009	2009	1025.48	\$1,228.24	\$1.20	February	914.64
2/18/2009	3/16/2009	2009	716.789	\$791.50	\$1.10		

Month	Average Therm Usage
January	1114.60
February	897.88
March	659.49
April	215.54
May	37.05
June	0.00
July	0.00
August	0.35
September	21.57
October	192.98
November	519.06
December	1138.45

Electric Bills - Westwood DPW Garage											
Account # 41 774 161 18											
Service From	Service To	Year	PSE&G Electric Charges Meter #: 626044514	KWH	Measured Demand (kW)	PSE & G Cost Per KWH	Demand Charge	Overall Cost Per kW Demand	Month	Adjusted Monthly Usage KWH	Adjusted Monthly Demand KW
12/29/2007	1/28/2008	2008	\$169.38	1,270	5.1	\$0.13	\$3.89	\$0.76	January	1,270	5.1
1/29/2008	2/27/2008	2008	\$193.82	1,424	5.9	\$0.14	\$3.89	\$0.66	February	1,424	5.9
2/28/2008	3/28/2008	2008	\$172.93	1,306	4.7	\$0.13	\$3.89	\$0.83	March	1,306	4.7
3/29/2008	4/28/2008	2008	\$150.14	1,120	4.6	\$0.13	\$3.89	\$0.85	April	1,120	4.6
4/29/2008	5/29/2008	2008	\$138.39	984	5.0	\$0.14	\$3.89	\$0.78	May	984	5.0
5/30/2008	6/26/2008	2008	\$173.76	730	4.3	\$0.24	\$3.89	\$0.90	June	730	4.3
6/27/2008	7/28/2008	2008	\$178.98	740	4.3	\$0.24	\$3.89	\$0.90	July	740	4.3
7/29/2008	8/26/2008	2008	\$180.65	736	4.1	\$0.25	\$3.90	\$0.95	August	736	4.1
8/27/2008	9/25/2008	2008	\$184.13	764	4.4	\$0.24	\$3.89	\$0.88	September	764	4.4
9/26/2008	10/24/2008	2008	\$157.28	952	4.9	\$0.17	\$3.89	\$0.79	October	952	4.9
10/25/2008	11/24/2008	2008	\$207.62	1,346	7.7	\$0.15	\$3.89	\$0.51	November	1,346	7.7
11/25/2008	12/23/2008	2008	\$360.64	2,721	8.3	\$0.13	\$3.89	\$0.47	December	2,721	8.3
12/24/2008	1/20/2009	2009	\$331.87	2,425	7.4	\$0.14	\$3.89	\$0.53	January	2,425	7.4
1/21/2009	2/17/2009	2009	\$314.37	2,093	9.7	\$0.15	\$3.89	\$0.40	February	2,093	9.7
2/18/2009	3/16/2009	2009	\$288.90	1,990	6.3	\$0.15	\$3.89	\$0.62	March	1,990	6.3

Month	Average (KWH)	Demand (KW)
January	1847.50	6.25
February	1758.50	7.80
March	1306.00	4.70
April	1120.00	4.60
May	984.00	5.00
June	730.00	4.30
July	740.00	4.30
August	736.00	4.10
September	764.00	4.40
October	952.00	4.90
November	1346.00	7.70
December	2721.00	8.30

Natural Gas Bills - Westwood DPW Garage							
Account # 41 774 161 18							
Service From	Service To	Year	Meter #: 3153991	PSE&G Gas Usage Charge	Cost Per Therm	Month	Adjusted Monthly Usage
12/29/2007	1/28/2008	2008	418.392	\$587.85	\$1.41	January	418.39
1/29/2008	2/28/2008	2008	512.841	\$761.03	\$1.48	February	512.84
3/1/2008	3/31/2008	2008	267.103	\$430.09	\$1.61	March	267.10
4/1/2008	4/29/2008	2008	57.385	\$98.76	\$1.72	April	57.39
4/30/2008	5/29/2008	2008	1.042	\$11.72	\$11.25	May	1.04
5/30/2008	6/27/2008	2008	0	\$9.93		June	0.00
6/28/2008	7/29/2008	2008	0	\$9.93		July	0.00
7/30/2008	8/26/2008	2008	0	\$9.93		August	0.00
8/27/2008	9/25/2008	2008	0	\$9.93		September	0.00
9/26/2008	10/27/2008	2008	0.00	\$9.93		October	0.00
10/28/2008	11/24/2008	2008	93.13	\$134.83	\$1.45	November	93.13
11/25/2008	12/23/2008	2008	416.709	\$576.84	\$1.38	December	416.71
12/24/2008	1/20/2009	2009	626.63	\$835.73	\$1.33	January	626.63
1/21/2009	2/17/2009	2009	534.714	\$645.22	\$1.21	February	534.71
2/18/2009	3/16/2009	2009	340.083	\$380.77	\$1.12		

Month	Average Therm Usage
January	522.51
February	523.78
March	267.10
April	57.39
May	1.04
June	0.00
July	0.00
August	0.00
September	0.00
October	0.00
November	93.13
December	416.71

APPENDIX B

STATEMENT OF ENERGY PERFORMANCE

PORTFOLIO MANAGER REFERENCE SHEET



STATEMENT OF ENERGY PERFORMANCE

Borough Hall

Building ID: 2252641

For 12-month Period Ending: February 28, 2009¹

Date SEP becomes ineligible: N/A

Date SEP Generated: April 01, 2010

Facility

Borough Hall
101 Washington Avenue
Westwood, NJ 07675

Facility Owner

Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility

Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

Year Built: 1994

Gross Floor Area (ft²): 29,780Energy Performance Rating² (1-100) 65**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	1,265,708
Natural Gas (kBtu) ⁴	998,729
Total Energy (kBtu)	2,264,437

Energy Intensity⁵

Site (kBtu/ft ² /yr)	76
Source (kBtu/ft ² /yr)	177

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	246
---	-----

Electric Distribution Utility

Public Service Elec & Gas Co

National Average Comparison

National Average Site EUI	91
National Average Source EUI	212
% Difference from National Average Source EUI	-17%
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.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

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

Certifying Professional

Matthew Goss
11 British American Boulevard
Latham, NY 12110

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	Borough Hall	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	101 Washington Avenue, Westwood, NJ 07675	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		☐
Borough Hall (Office)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	29,780 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	84 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	26	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	51	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: Public Service Elec & Gas Co

Fuel Type: Electricity		
Meter: 728013246 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
01/21/2009	02/17/2009	25,600.00
12/24/2008	01/20/2009	25,520.00
11/25/2008	12/23/2008	26,640.00
10/27/2008	11/24/2008	26,560.00
09/27/2008	10/26/2008	27,040.00
08/28/2008	09/26/2008	33,200.00
07/30/2008	08/27/2008	35,760.00
06/27/2008	07/29/2008	44,080.00
05/29/2008	06/26/2008	37,840.00
04/29/2008	05/28/2008	26,720.00
03/31/2008	04/28/2008	25,840.00
02/28/2008	03/30/2008	28,880.00
728013246 Consumption (kWh (thousand Watt-hours))		363,680.00
728013246 Consumption (kBtu (thousand Btu))		1,240,876.16
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		1,240,876.16
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: 3355385 (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
01/21/2009	02/17/2009	2,092.82
12/24/2008	01/20/2009	2,245.43
11/25/2008	12/23/2008	1,823.49
10/27/2008	11/24/2008	1,084.08
09/27/2008	10/26/2008	242.53
08/28/2008	09/26/2008	42.90
07/30/2008	08/27/2008	42.99
06/27/2008	07/29/2008	51.22
05/29/2008	06/26/2008	47.95
04/29/2008	05/28/2008	56.29

03/31/2008	04/28/2008	314.06
02/28/2008	03/30/2008	1,413.73
3355385 Consumption (therms)		9,457.49
3355385 Consumption (kBtu (thousand Btu))		945,749.00
Total Natural Gas Consumption (kBtu (thousand Btu))		945,749.00
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 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

Borough Hall
101 Washington Avenue
Westwood, NJ 07675

Facility Owner

Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility

Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

General Information

Borough Hall	
Gross Floor Area Excluding Parking: (ft ²)	29,780
Year Built	1994
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

Borough Hall	
Space Type	Office
Gross Floor Area(ft ²)	29,780
Weekly operating hours	84
Workers on Main Shift	26
Number of PCs	51
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 02/28/2009)	Baseline	Rating of 75	Target	National Average
Energy Performance Rating	65		75	N/A	50
Energy Intensity					
Site (kBtu/ft ²)	76	N/A	67	N/A	91
Source (kBtu/ft ²)	177	N/A	157	N/A	212
Energy Cost					
\$/year	\$ 70,466.68	N/A	\$ 62,497.01	N/A	\$ 84,497.00
\$/ft ² /year	\$ 2.37	N/A	\$ 2.10	N/A	\$ 2.84
Greenhouse Gas Emissions					
MtCO ₂ e/year	246	N/A	218	N/A	295
kgCO ₂ e/ft ² /year	8	N/A	7	N/A	10

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

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE Public Library

Building ID: 2252727

For 12-month Period Ending: November 30, 2009¹

Date SEP becomes ineligible: N/A

Date SEP Generated: April 01, 2010

Facility

Public Library
49 Park Avenue
Westwood, NJ 07675

Facility Owner

Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility

Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

Year Built: 1939

Gross Floor Area (ft²): 16,000

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	429,870
Natural Gas (kBtu) ⁴	552,073
Total Energy (kBtu)	981,943

Energy Intensity⁵

Site (kBtu/ft ² /yr)	61
Source (kBtu/ft ² /yr)	126

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	95
---	----

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	-41%
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.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

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

Certifying Professional

Matthew Goss
11 British American Boulevard
Latham, NY 12110

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	Public Library	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	49 Park Avenue, Westwood, NJ 07675	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		☐
Library (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	16,000 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	30(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	56Hours(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	7(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: 678004708 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
10/24/2009	11/23/2009	10,920.00
09/25/2009	10/23/2009	10,290.00
08/25/2009	09/24/2009	10,740.00
07/25/2009	08/24/2009	12,480.00
06/26/2009	07/24/2009	9,780.00
05/22/2009	06/25/2009	12,630.00
04/21/2009	05/21/2009	10,650.00
03/17/2009	04/20/2009	11,160.00
02/18/2009	03/16/2009	9,090.00
01/21/2009	02/17/2009	9,900.00
12/24/2008	01/20/2009	8,760.00
678004708 Consumption (kWh (thousand Watt-hours))		116,400.00
678004708 Consumption (kBtu (thousand Btu))		397,156.80
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		397,156.80
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: 3166230 (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
10/24/2009	11/23/2009	316.69
09/25/2009	10/23/2009	107.36
08/25/2009	09/24/2009	0.00
07/25/2009	08/24/2009	0.00
06/26/2009	07/24/2009	0.00
05/22/2009	06/25/2009	128.21
04/21/2009	05/21/2009	123.00
03/17/2009	04/20/2009	699.74
02/18/2009	03/16/2009	854.92
01/21/2009	02/17/2009	1,096.64
12/24/2008	01/20/2009	1,172.84

3166230 Consumption (therms)	4,499.40
3166230 Consumption (kBtu (thousand Btu))	449,940.00
Total Natural Gas Consumption (kBtu (thousand Btu))	449,940.00
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 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

Public Library
49 Park Avenue
Westwood, NJ 07675

Facility Owner

Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility

Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

General Information

Public Library	
Gross Floor Area Excluding Parking: (ft ²)	16,000
Year Built	1939
For 12-month Evaluation Period Ending Date:	November 30, 2009

Facility Space Use Summary

Library	
Space Type	Other - Other
Gross Floor Area(ft ²)	16,000
Number of PCs ^o	30
Weekly operating hours ^o	56
Workers on Main Shift ^o	7

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 11/30/2009)	Baseline (Ending Date 12/31/2008)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	61	65	0	N/A	104
Source (kBtu/ft ²)	126	132	0	N/A	213
Energy Cost					
\$/year	\$ 29,862.85	\$ 27,707.29	N/A	N/A	\$ 50,606.75
\$/ft ² /year	\$ 1.87	\$ 1.73	N/A	N/A	\$ 3.17
Greenhouse Gas Emissions					
MtCO ₂ e/year	95	99	0	N/A	161
kgCO ₂ e/ft ² /year	6	6	0	N/A	10

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.



STATEMENT OF ENERGY PERFORMANCE

DPW Main Building

Building ID: 2261232

For 12-month Period Ending: February 28, 2009¹

Date SEP becomes ineligible: N/A

Date SEP Generated: April 01, 2010

Facility

DPW Main Building
Sand Road
Glassboro, NJ 08028

Facility Owner

Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility

Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

Year Built: 1922

Gross Floor Area (ft²): 10,500Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	266,700
Natural Gas (kBtu) ⁴	486,656
Total Energy (kBtu)	753,356

Energy Intensity⁵

Site (kBtu/ft ² /yr)	72
Source (kBtu/ft ² /yr)	133

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	67
---	----

Electric Distribution Utility

Pepco - Atlantic City Electric Co

National Average Comparison

National Average Site EUI	4
National Average Source EUI	12
% Difference from National Average Source EUI	1012%
Building Type	Self-Storage

Stamp of Certifying Professional

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

Meets Industry Standards⁶ for Indoor Environmental Conditions:

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

Certifying Professional

Matthew Goss
11 British American Boulevard
Latham, NY 12110

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	DPW Main Building	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Self-Storage	Is this an accurate description of the space in question?		☐
Location	Sand Road, Glassboro, NJ 08028	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		☐
DPW Main Building (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	10,500 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	4(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	2(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: Pepco - Atlantic City Electric Co

Fuel Type: Electricity		
Meter: 626004414 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
01/21/2009	02/17/2009	9,870.00
12/24/2008	01/20/2009	9,300.00
11/25/2008	12/23/2008	9,108.00
10/25/2008	11/24/2008	6,630.00
09/26/2008	10/24/2008	4,038.00
08/27/2008	09/25/2008	4,206.00
07/29/2008	08/26/2008	4,674.00
06/27/2008	07/28/2008	5,448.00
05/30/2008	06/26/2008	4,122.00
04/29/2008	05/29/2008	3,948.00
03/29/2008	04/28/2008	5,334.00
02/28/2008	03/28/2008	8,340.00
626004414 Consumption (kWh (thousand Watt-hours))		75,018.00
626004414 Consumption (kBtu (thousand Btu))		255,961.42
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		255,961.42
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: 1673518 (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
01/21/2009	02/17/2009	1,025.48
12/24/2008	01/20/2009	1,198.95
11/25/2008	12/23/2008	887.73
10/25/2008	11/24/2008	433.21
09/26/2008	10/24/2008	114.99
08/27/2008	09/25/2008	2.09
07/29/2008	08/26/2008	0.00
06/27/2008	07/28/2008	0.00
05/30/2008	06/26/2008	0.00
04/29/2008	05/29/2008	39.61

03/29/2008	04/28/2008	235.80
02/29/2008	03/28/2008	659.41
1673518 Consumption (therms)		4,597.27
1673518 Consumption (kBtu (thousand Btu))		459,727.00
Total Natural Gas Consumption (kBtu (thousand Btu))		459,727.00
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 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
DPW Main Building
Sand Road
Glassboro, NJ 08028

Facility Owner
Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility
Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

General Information

DPW Main Building	
Gross Floor Area Excluding Parking: (ft ²)	10,500
Year Built	1922
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

DPW Main Building	
Space Type	Other - Self-Storage
Gross Floor Area(ft ²)	10,500
Number of PCs ^o	4
Weekly operating hours ^o	40
Workers on Main Shift ^o	2

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 02/28/2009)	Baseline (Ending Date 12/31/2008)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	72	68	0	N/A	4
Source (kBtu/ft ²)	133	127	0	N/A	12
Energy Cost					
\$/year	\$ 17,893.34	\$ 19,930.53	N/A	N/A	\$ 997.54
\$/ft ² /year	\$ 1.70	\$ 1.90	N/A	N/A	\$ 0.09
Greenhouse Gas Emissions					
MtCO ₂ e/year	67	63	0	N/A	4
kgCO ₂ e/ft ² /year	6	6	0	N/A	0

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

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

DPW Garage

Building ID: 2254797

For 12-month Period Ending: February 28, 2009¹

Date SEP becomes ineligible: N/A

Date SEP Generated: April 01, 2010

Facility

DPW Garage
Sand Road
Westwood, NJ 07675

Facility Owner

Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility

Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

Year Built: 1996

Gross Floor Area (ft²): 7,500Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	56,744
Natural Gas (kBtu) ⁴	213,526
Total Energy (kBtu)	270,270

Energy Intensity⁵

Site (kBtu/ft ² /yr)	36
Source (kBtu/ft ² /yr)	55

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	20
---	----

Electric Distribution Utility

Public Service Elec & Gas Co

National Average Comparison

National Average Site EUI	4
National Average Source EUI	12
% Difference from National Average Source EUI	359%
Building Type	Self-Storage

Stamp of Certifying Professional

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

Meets Industry Standards⁶ for Indoor Environmental Conditions:

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

Certifying Professional

Matthew Goss
11 British American Boulevard
Latham, NY 12110

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	DPW Garage	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Self-Storage	Is this an accurate description of the space in question?		☐
Location	Sand Road, Westwood, NJ 07675	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		☐
DPW Garage (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	7,500 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
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	0(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: 626044514 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
01/21/2009	02/17/2009	2,093.00
12/24/2008	01/20/2009	2,425.00
11/25/2008	12/23/2008	2,721.00
10/25/2008	11/24/2008	1,346.00
09/26/2008	10/24/2008	952.00
08/27/2008	09/25/2008	754.00
07/29/2008	08/26/2008	736.00
06/27/2008	07/28/2008	740.00
05/30/2008	06/26/2008	730.00
04/29/2008	05/29/2008	984.00
03/29/2008	04/28/2008	1,120.00
02/28/2008	03/28/2008	1,306.00
626044514 Consumption (kWh (thousand Watt-hours))		15,907.00
626044514 Consumption (kBtu (thousand Btu))		54,274.68
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		54,274.68
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: 3153991 (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
01/21/2009	02/17/2009	534.71
12/24/2008	01/20/2009	626.63
11/25/2008	12/23/2008	416.71
10/28/2008	11/24/2008	93.13
09/26/2008	10/27/2008	0.00
08/27/2008	09/25/2008	0.00
07/30/2008	08/26/2008	0.00
06/28/2008	07/29/2008	0.00
05/30/2008	06/27/2008	0.00
04/30/2008	05/29/2008	1.04

04/01/2008	04/29/2008	57.39
03/01/2008	03/31/2008	267.10
3153991 Consumption (therms)		1,996.71
3153991 Consumption (kBtu (thousand Btu))		199,671.00
Total Natural Gas Consumption (kBtu (thousand Btu))		199,671.00
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 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

DPW Garage
Sand Road
Westwood, NJ 07675

Facility Owner

Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility

Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

General Information

DPW Garage	
Gross Floor Area Excluding Parking: (ft ²)	7,500
Year Built	1996
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

DPW Garage	
Space Type	Other - Self-Storage
Gross Floor Area(ft ²)	7,500
Number of PCs ^o	0
Weekly operating hours ^o	40
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 02/28/2009)	Baseline (Ending Date 12/31/2008)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	36	32	0	N/A	4
Source (kBtu/ft ²)	55	49	0	N/A	12
Energy Cost					
\$/year	\$ 5,594.90	\$ 5,178.81	N/A	N/A	\$ 620.97
\$/ft ² /year	\$ 0.75	\$ 0.69	N/A	N/A	\$ 0.08
Greenhouse Gas Emissions					
MtCO ₂ e/year	20	18	0	N/A	2
kgCO ₂ e/ft ² /year	3	2	0	N/A	0

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

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Fire Department

Building ID: 2254795

For 12-month Period Ending: November 30, 2008¹

Date SEP becomes ineligible: N/A

Date SEP Generated: April 01, 2010

Facility

Fire Department
93 Center Avenue
Westwood, NJ 07675

Facility Owner

Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility

Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

Year Built: 2004

Gross Floor Area (ft²): 14,552Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	477,874
Natural Gas (kBtu) ⁴	512,781
Total Energy (kBtu)	990,655

Energy Intensity⁵

Site (kBtu/ft ² /yr)	68
Source (kBtu/ft ² /yr)	147

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	100
---	-----

Electric Distribution Utility

Public Service Elec & Gas Co

National Average Comparison

National Average Site EUI	78
National Average Source EUI	157
% Difference from National Average Source EUI	-7%
Building Type	Fire Station/Police Station

Stamp of Certifying Professional

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

Meets Industry Standards⁶ for Indoor Environmental Conditions:

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

Certifying Professional

Matthew Goss
11 British American Boulevard
Latham, NY 12110

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	Fire Department	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Fire Station/Police Station	Is this an accurate description of the space in question?		☐
Location	93 Center Avenue, Westwood, NJ 07675	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		☐
Fire Department (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	14,552 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	8(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	15Hours(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	1(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: 728011249 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
10/28/2008	11/25/2008	8,520.00
09/27/2008	10/27/2008	9,920.00
08/28/2008	09/26/2008	12,120.00
07/30/2008	08/27/2008	12,480.00
06/28/2008	07/29/2008	16,520.00
05/30/2008	06/27/2008	13,240.00
04/30/2008	05/29/2008	9,840.00
04/01/2008	04/29/2008	9,840.00
02/29/2008	03/31/2008	11,800.00
01/30/2008	02/28/2008	11,960.00
12/29/2007	01/29/2008	11,760.00
728011249 Consumption (kWh (thousand Watt-hours))		128,000.00
728011249 Consumption (kBtu (thousand Btu))		436,736.00
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		436,736.00
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: 3228079 (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
10/28/2008	11/25/2008	457.28
09/27/2008	10/27/2008	222.67
08/28/2008	09/26/2008	160.10
07/30/2008	08/27/2008	161.46
06/28/2008	07/29/2008	177.72
05/30/2008	06/27/2008	171.99
04/30/2008	05/29/2008	275.18
04/01/2008	04/29/2008	311.97
02/29/2008	03/31/2008	759.58
01/30/2008	02/28/2008	921.45
12/29/2007	01/29/2008	997.46

3228079 Consumption (therms)	4,616.86
3228079 Consumption (kBtu (thousand Btu))	461,686.00
Total Natural Gas Consumption (kBtu (thousand Btu))	461,686.00
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 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

Fire Department
93 Center Avenue
Westwood, NJ 07675

Facility Owner

Borough of Westwood
101 Washington Avenue
Westwood, NJ 07675

Primary Contact for this Facility

Robert Hoffmann
101 Washington Avenue
Westwood, NJ 07675

General Information

Fire Department	
Gross Floor Area Excluding Parking: (ft ²)	14,552
Year Built	2004
For 12-month Evaluation Period Ending Date:	November 30, 2008

Facility Space Use Summary

Fire Department	
Space Type	Other - Fire Station/Police Station
Gross Floor Area(ft ²)	14,552
Number of PCs ^o	8
Weekly operating hours ^o	15
Workers on Main Shift ^o	1

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 11/30/2008)	Baseline (Ending Date 12/31/2008)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	68	70	0	N/A	78
Source (kBtu/ft ²)	147	148	0	N/A	157
Energy Cost					
\$/year	\$ 25,138.36	\$ 27,598.05	N/A	N/A	\$ 28,801.29
\$/ft ² /year	\$ 1.73	\$ 1.90	N/A	N/A	\$ 1.98
Greenhouse Gas Emissions					
MtCO ₂ e/year	100	101	0	N/A	115
kgCO ₂ e/ft ² /year	7	7	0	N/A	8

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

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



PORTFOLIO MANAGER QUICK REFERENCE GUIDE

Portfolio Manager is an interactive energy management tool that allows you to track and assess energy and water consumption across your entire portfolio of buildings in a secure online environment. Use this Quick Reference Guide to identify opportunities for energy efficiency improvements, track your progress over time, and verify results.

IDENTIFY ENERGY EFFICIENCY PROJECTS

Use Portfolio Manager to identify under-performing buildings to target for energy efficiency improvements and establish baselines for setting and measuring progress for energy efficiency improvement projects over time.

The screenshot shows the 'Facility Summary' page for 'Fire Station 2'. The 'General Information' section includes address, year built, and property type. The 'Facility Performance' section shows energy use intensity and emissions. The 'Space Use' section lists building spaces with a red circle and number 6 highlighting the 'Add Space' button. The 'Energy Meters' section lists meters with a red circle and number 7 highlighting the 'Add Meter' button.

STEP	ACTIVITY	ACTION
1	Access Portfolio Manager. (step not shown)	Visit www.energystar.gov/benchmark . Scroll down to the Login section on the right-hand side in the middle of the page.
2	Access your account: (step not shown) • Create a new account. • Login to an existing account.	• Click REGISTER, and follow instructions. • Enter user name and password, and click LOGIN.
3	Review system updates and enter account. (step not shown)	Click ACCESS MY PORTFOLIO , located below Welcome to Portfolio Manager .
4	Add a new facility. (step not shown)	Click ADD a Property, located in the upper right portion of the screen.
5	Select property type and enter general facility information. (step not shown)	Select the option that most closely resembles your facility and click CONTINUE . Enter general data and click SAVE . For more information on facility space types, see: www.energystar.gov/index.cfm?c=eligibility.bus_portfolio/portfolio_manager_space_types .
6	Enter space use data.	From the Facility Summary page, shown above, go to the Space Use section, located half way down the page, and click ADD SPACE . • Enter a facility name. In the Select a Space Type menu, select the appropriate space type(s) for your building. If your space is not listed, select Other. Click CONTINUE. • Enter building characteristics. Click SAVE. Information required for each space type is listed here: www.energystar.gov/index.cfm?c=eligibility.bus_portfolio/portfolio_manager_space_types. • Repeat steps above to add all major spaces in your facility. Use bulk import service to minimize manual data entry of large sets of facility data (10 or more facilities or campuses are required). • Go back to My Portfolio by clicking on the link in the upper left portion of the page. • Click IMPORT Facility Data Using Templates, located below Add a Property.
7	Enter energy use data.	From the Facility Summary page, go to the Energy Meters section, located below the Space Use section, and click ADD METER . • Enter meter name, type, and units. Click SAVE. • Enter number of months and start date. Click CONTINUE. • Enter energy use and cost for each month. Click SAVE. • Repeat for all energy meters and fuel types.

PORTFOLIO MANAGER

[ACCOUNT INFORMATION](#)
[CONTACTS](#)
[FAQ](#)
[FREQUENTLY ASKED QUESTIONS](#)
[CONTACT US](#)
[HELP](#)
[LOGOUT](#)

[Home](#) > **My Portfolio**

Group Averages

Baseline Rating: 72 Facilities Included: 1	Current Rating: 80 Facilities Included: 1
Change from Baseline: Group Adjusted Percent Energy Use (%): -14.8% Facilities Included: 2	

Averages are weighted by Total Floor Space.
[More about Baselines](#)
[More about Change from Baseline: Adjusted Energy Use](#)

[Add a Property](#)
[Import Facility Data Using Templates](#)

Work with Facilities
[Update Multiple Meters](#)
[Share Facilities](#)
[Request Energy Performance Report](#)

Apply for Recognition
[Apply for the ENERGY STAR](#)
[ENERGY STAR Leaders](#)

Automated Benchmarking
[Get Started Now](#)

My Facilities
My Campuses

GROUP: Fire Stations

8

VIEW: Summary View

9a

[Download](#) in Excel

Search Facility Name:

Search

Results 1 - 2 of 2

All # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Facility Name	Current Source Energy Intensity (kBtu/Sq. Ft.)	Change from Baseline: Adjusted Energy Use (%)	Change from Baseline: Energy Use Intensity (kBtu/Sq. Ft.)	Change from Baseline: GHG Emissions (MtCO ₂ e)	Total Energy Cost per Sq. Ft. (US Dollars (\$))
Fire Station 1	160.1	-12.3	-6.1	-275.86	\$0.30
Fire Station 2	172.6	-17.2	-10.7	-488.62	\$0.37

[Download](#) in Excel

9b

Search Facility Name:

Search

Results 1 - 2 of 2

All # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

The rating is calculated by using the last day of the latest full calendar month where all meters in the facility have meter entries; the Period Ending date reflects that particular date.

STEP	ACTIVITY	ACTION
8	Create custom groups.	Organize facilities into groups (e.g., Fire Stations, Northwest Region). Groups are completely customizable, and each facility may belong to multiple groups. - From the My Portfolio page, click CREATE GROUP, located directly to the right of the Group drop-down menu. - Follow instructions to select buildings and name your group. - Once they have been saved, custom groups will be available in the Group drop-down menu.
9	View and interpret results.	Option 1: Go to My Portfolio and view all buildings to compare performance metrics. Option 2: Export data to Microsoft® Excel. - On the My Portfolio page, select the view, from the View drop-down menu that will display the data you wish to export. The My Portfolio page will update to display the selected view. (9a) - Select the DOWNLOAD IN EXCEL link. A File Download dialog window will open. Follow the steps provided by Excel. (9b) - Use Excel functionality to view building energy performance graphically. The example below shows a comparison of Energy Use Intensity for a portfolio of fire stations, identifying under-performing buildings to target for energy efficiency improvements.

TRACK PROGRESS OVER TIME

Portfolio Manager comes pre-populated with nine standard summary views of facility data, which are displayed on the My Portfolio summary page. These standard views include:

- Summary: Energy Use
- Performance: Green House Gas Emissions
- Performance: Financial
- Performance: Water Use

Additionally, users can create and save custom downloadable views by choosing from more than 70 different metrics. The default view set by the user will display automatically after logging into Portfolio Manager, and data from all views can be exported to Microsoft® Excel.

PORTFOLIO MANAGER

Home > My Portfolio

GROUP: Fire Stations | Create Group | Edit Group | View All

VIEW: MyView | Create View | Edit View | View All

Download in Excel

Results 1 - 2 of 2

Facility Name	Number of Students	% Difference from National Average Source EUI	Baseline Weather Normalized Source Energy Intensity (kBtu/Sq. Ft.)	Current Weather Normalized Source Energy Intensity (kBtu/Sq. Ft.)	Baseline Rating (1-100)	Current Rating (1-100)	Total Floor Space (Sq. Ft.)
Fire Station 1	0	-32.6	180.4	160.1	72	80	300,000
Fire Station 2	0	9.9	208.4	172.6	N/A	N/A	300,000

PORTFOLIO MANAGER

Home > My Portfolio > Create New View

Create New View
How do I use this page?

Number of Facilities to display on each page:
☐ 25 ☒ 50 ☐ 100 ☐ All (note: larger Portfolios will take longer to load)

To create/edit a custom View of your facilities in Portfolio Manager, select **up to 7** columns from the list below. Use "Preferred Column Order" to set the order in which they will display in the View.

View Name: **Set this View as My Portfolio Default:** ☐

Preferred Column Order	Facility Data	Preferred Column Order	Facility Data
1	ENERGY STAR Rating	1	Water
2	Baseline Rating (1-100) (N/A for Campuses)	2	Indoor Water Cost (US Dollars (\$))
3	Current Rating (1-100) (N/A for Campuses)	3	Indoor Water Use (kGal)
4	Target Rating (1-100) (N/A for Campuses)	4	Indoor Water Use per Sq. Ft. (kGal)
5	Period Ending Dates	5	Outdoor Water Cost (US Dollars (\$))
6	Baseline Energy Period Ending Date	6	Outdoor Water Use (kGal)
7	Current Energy Period Ending Date	7	Total Indoor and Outdoor Water Cost (US Dollars (\$))
8	Water Use Period Ending	8	Total Indoor and Outdoor Water Use (kGal)
9	Site Energy	9	Wastewater/Sewer Cost (US Dollars (\$))
10	Baseline Site Electric Use (kWh)	10	Wastewater/Sewer Use (kGal)
		11	Water Use Alerts (N/A for Campuses)
		12	Performance: GHG Emissions

CREATE A CUSTOM VIEW

STEP ACTION

- From the **My Portfolio** page or the **Facility Summary** page, select the **Create View** link, located directly to the right of the **View** drop-down menu.
- Enter a name for the view. To set as the default view, select the box labeled **Set this View as My Portfolio Default**, located directly to the right of **View Name**. You may include up to 7 (seven) columns in each view.
- Choose each metric to be included in the view by selecting an order number from the **Preferred Column Order** drop-down menu to the left of the **Facility Data** column.
- Click **SAVE** at the bottom of the page. You will be returned to the **My Portfolio** page, and your custom view will be available in the **View** drop-down menu. (step not shown)

VERIFY AND DOCUMENT RESULTS

Use Portfolio Manager to quickly and accurately document reductions in energy use, greenhouse gas emissions, water use, and energy costs for an individual building or an entire portfolio. This valuable information can be used to provide a level of transparency and accountability to help demonstrate strategic use of funding.

Generate a Statement of Energy Performance that includes valuable information about your building's performance, including:

- Normalized energy use intensity
- National average comparisons
- Greenhouse gas emissions
- Energy performance rating (if available)

In addition, you can also request an Energy Performance Report to see the change in performance over time for selected buildings or an entire portfolio. Available comparative metrics in this report include:

- Normalized energy use intensity
- Total electric use
- Total natural gas use
- Energy performance rating (if available)

OMB No. 2050-0347

STATEMENT OF ENERGY PERFORMANCE Fire Station 2

Building ID: 1642681
For 12-month Period Ending: December 31, 2008
Date SEP becomes ineligible: N/A
Date SEP Generated: March 05, 2009

Facility Fire Station 2 000 Blank Street Arlington, VA 22209	Facility Owner N/A	Primary Contact for this Facility N/A
Year Built: 1990 Gross Floor Area (ft²): 300,000	Energy Intensity⁵ Site (kBtu/ft²/yr) 52 Source (kBtu/ft²/yr) 173	
Energy Performance Rating ² (1-100)	Emissions (based on site energy use) Greenhouse Gas Emissions (MTCO ₂ e/year) 2,352	
Site Energy Use Summary³ Electricity (kBtu) 15,500,000 Natural Gas (kBtu) Total Energy (kBtu)	Energy Intensity⁴ Site (kBtu/ft²/yr) 62 Source (kBtu/ft²/yr) 173 Emissions (based on site energy use) Greenhouse Gas Emissions (MTCO ₂ e/year) 2,352	
Electric Distribution Utility Virginia Electric & Power Co National Average Comparison National Average Site EUI 78 National Average Source EUI 157 % Difference from National Average Source EUI 10% Building Type Fire Station/Police Station	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 Standards⁶ 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 award is 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. Intensity values are normalized to 1000 sq ft of floor area.
6. See ASHRAE 90.1-2001, Table 6.1 for more information.

ENERGY STAR **PORTFOLIO MANAGER**

Home > My Portfolio > Fire Station 2

Facility Summary: **Fire Station 2**
[How do I use this page?](#)

Building ID: 1642681
Level of Access: Building Data Administrator

Electric Distribution Utility: Virginia Electric & Power Co
Regional Power Grid: [SERC Virginia/Carolina](#)
[Select my Power Generation Plant](#) to calculate my electric emissions rate
Electric Emissions Rate (lbCO₂/kWh) 151.7 ([what is this?](#))

1 [Generate a Statement of Energy Performance](#) for uses other than applying for the ENERGY STAR

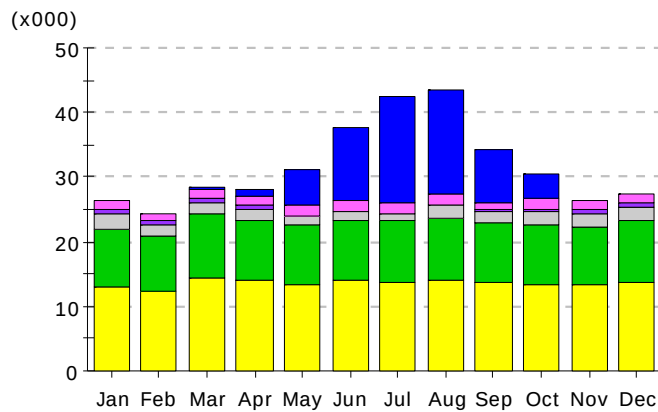
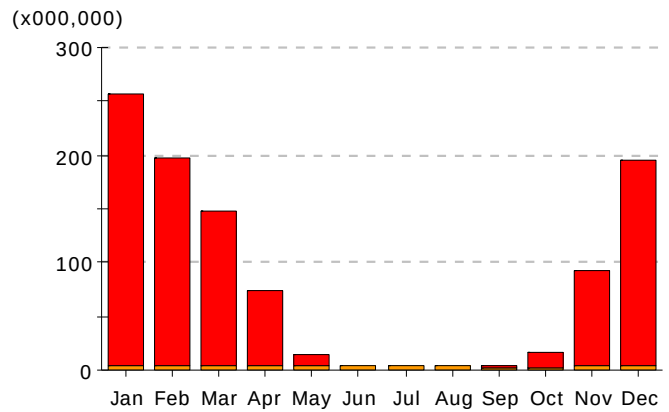
General Information Edit	
Address: 000 Blank Street, Arlington, VA 22209	
Year Built: 1990	
Property Type: Single Facility	
Baseline Rating: N/A	Current Rating: N/A
Eligibility for the ENERGY STAR	
N/A	

GENERATE A STATEMENT OF ENERGY PERFORMANCE AND AN ENERGY PERFORMANCE REPORT

STEP	ACTION
1	From your selected building's Facility Summary page, click GENERATE A STATEMENT OF ENERGY PERFORMANCE .
2	On the next page, select a period ending date. (step not shown)
3	Click GENERATE REPORT , located in the bottom right corner of the screen. (step not shown)
4	Save the Statement of Energy Performance, accompanying Data Checklist, and Facility Summary that include information on energy use intensity and greenhouse gas emissions.
5	From the My Portfolio page, click REQUEST ENERGY PERFORMANCE REPORT , located under Work with Facilities , which shows reductions in key performance indicators over a user-specified time period. Specify the type of report, the facilities to be included, and the requested report columns. The report will be e-mailed to a user-specified address within one business day. (step not shown)

APPENDIX C

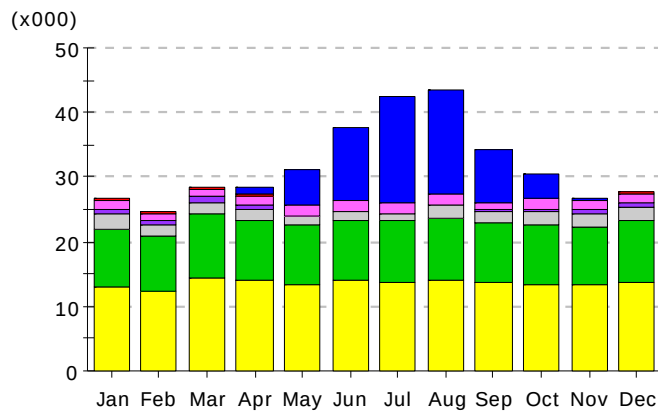
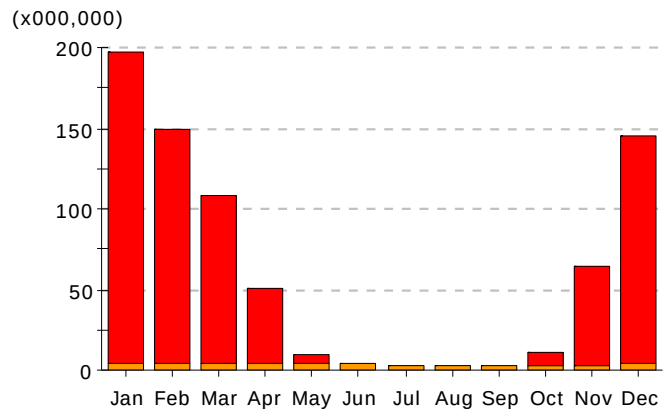
eQUEST MODEL RUN SUMMARIES

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.18	1.09	5.26	11.43	16.36	16.31	8.32	3.63	0.19	0.11	62.89
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.26	1.07	1.27	1.40	1.69	1.61	1.48	1.49	1.18	1.70	1.36	1.29	16.80
Pumps & Aux.	0.80	0.71	0.73	0.56	0.20	0.02	-	-	0.06	0.35	0.64	0.77	4.83
Ext. Usage	2.15	1.65	1.83	1.77	1.26	1.22	1.26	2.05	1.99	2.05	2.08	2.15	21.46
Misc. Equip.	8.93	8.50	9.88	9.50	9.17	9.50	9.40	9.64	9.26	9.17	9.02	9.40	111.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	13.13	12.47	14.45	13.89	13.46	13.89	13.79	14.12	13.57	13.46	13.24	13.79	163.26
Total	26.26	24.40	28.33	28.21	31.04	37.68	42.30	43.62	34.39	30.36	26.53	27.51	380.62

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	253.2	194.6	144.5	70.7	10.5	0.2	-	-	0.2	12.8	89.2	191.0	966.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.5	3.6	4.3	4.1	3.5	3.5	3.1	3.1	2.9	3.0	3.2	3.6	41.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	256.7	198.2	148.8	74.8	13.9	3.7	3.1	3.1	3.1	15.8	92.4	194.6	1,008.2

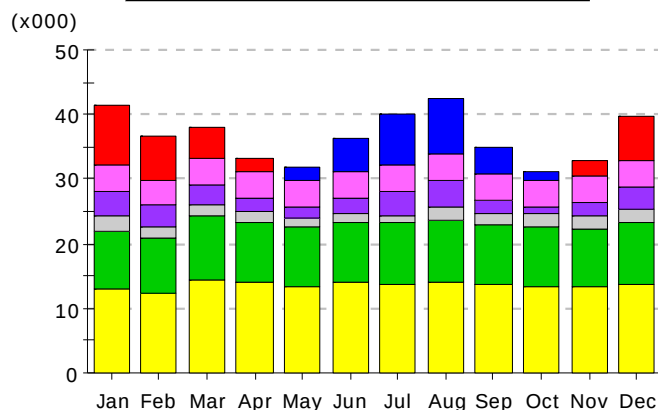
Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.18	1.09	5.26	11.43	16.36	16.31	8.32	3.63	0.19	0.11	62.89
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.29	0.24	0.20	0.11	0.02	0.00	-	-	0.00	0.02	0.14	0.25	1.28
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.26	1.07	1.27	1.40	1.69	1.61	1.48	1.49	1.18	1.70	1.36	1.29	16.80
Pumps & Aux.	0.85	0.76	0.78	0.61	0.23	0.02	-	-	0.07	0.38	0.69	0.82	5.19
Ext. Usage	2.15	1.65	1.83	1.77	1.26	1.22	1.26	2.05	1.99	2.05	2.08	2.15	21.46
Misc. Equip.	8.93	8.50	9.88	9.50	9.17	9.50	9.40	9.64	9.26	9.17	9.02	9.40	111.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	13.13	12.47	14.45	13.89	13.46	13.89	13.79	14.12	13.57	13.46	13.24	13.79	163.26
Total	26.61	24.69	28.58	28.36	31.08	37.68	42.30	43.62	34.39	30.41	26.72	27.82	382.26

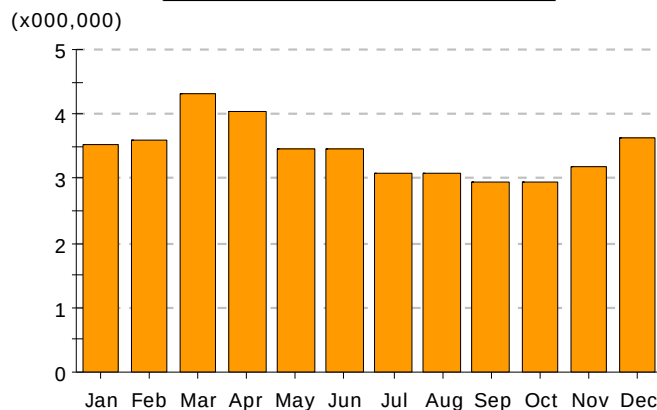
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	193.76	145.87	104.13	47.08	5.82	0.07	-	-	0.06	7.33	60.91	140.98	706.01
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.54	3.61	4.32	4.06	3.47	3.47	3.11	3.09	2.95	2.97	3.19	3.62	41.40
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	197.29	149.48	108.46	51.14	9.29	3.54	3.11	3.09	3.01	10.30	64.11	144.60	747.41

Electric Consumption (kWh)



Gas Consumption (Btu)

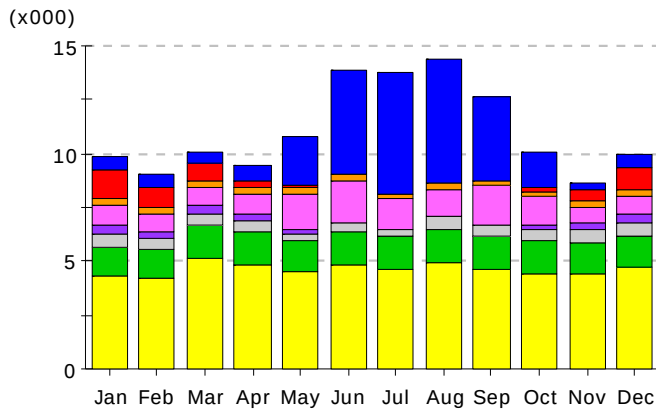
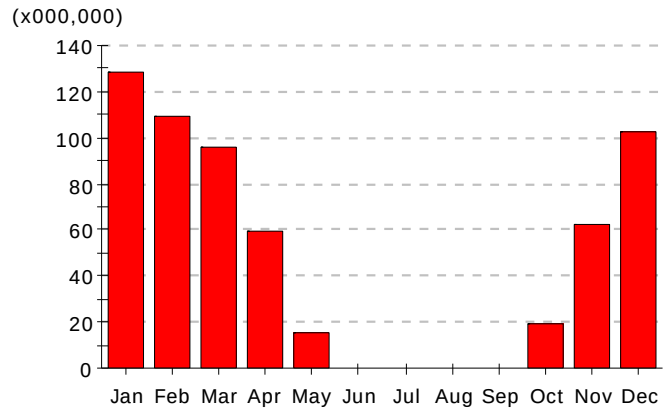


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.21	1.89	5.15	7.93	8.38	4.06	1.08	0.03	0.00	28.72
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.00	6.88	4.88	2.01	0.11	-	-	-	-	0.15	2.65	6.65	32.33
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.12	3.72	4.12	3.99	4.12	3.99	4.12	4.12	3.99	4.12	3.99	4.12	48.50
Pumps & Aux.	3.98	3.38	2.92	1.91	1.75	2.59	3.56	4.02	1.93	1.00	2.04	3.52	32.60
Ext. Usage	2.15	1.65	1.83	1.77	1.26	1.22	1.26	2.05	1.99	2.05	2.08	2.15	21.46
Misc. Equip.	8.93	8.50	9.88	9.50	9.17	9.50	9.40	9.64	9.26	9.17	9.02	9.40	111.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	13.13	12.47	14.45	13.89	13.46	13.89	13.79	14.12	13.57	13.46	13.24	13.79	163.26
Total	41.32	36.59	38.08	33.28	31.76	36.34	40.06	42.33	34.79	31.03	33.05	39.64	438.25

Gas Consumption (Btu x000,000)

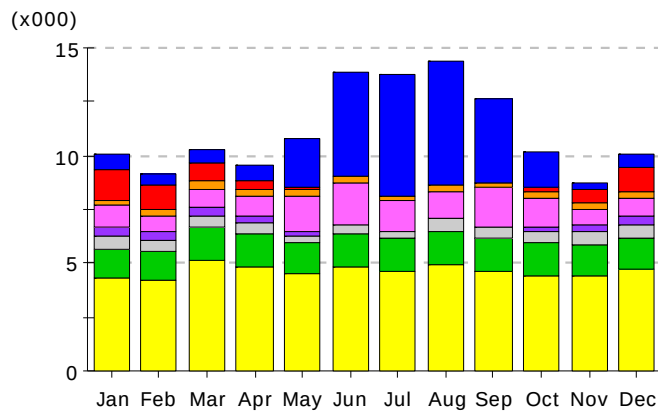
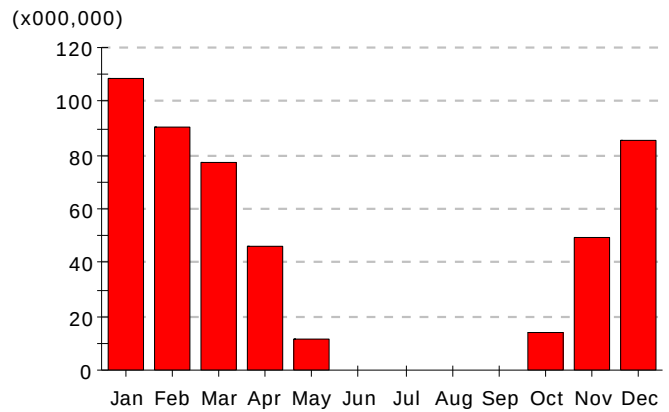
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.54	3.61	4.32	4.05	3.46	3.45	3.09	3.07	2.93	2.96	3.19	3.61	41.30
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3.54	3.61	4.32	4.05	3.46	3.45	3.09	3.07	2.93	2.96	3.19	3.61	41.30

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.66	0.56	0.56	0.69	2.26	4.77	5.61	5.84	3.84	1.69	0.36	0.67	27.52
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.31	1.02	0.78	0.36	0.12	0.02	0.00	-	0.03	0.17	0.50	1.03	5.34
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.29	0.29	0.34	0.32	0.28	0.28	0.25	0.25	0.23	0.24	0.26	0.29	3.30
Vent. Fans	0.96	0.77	0.85	0.91	1.69	2.04	1.39	1.28	1.82	1.37	0.72	0.83	14.63
Pumps & Aux.	0.41	0.37	0.38	0.30	0.12	0.01	-	-	0.04	0.19	0.34	0.40	2.57
Ext. Usage	0.57	0.44	0.49	0.47	0.34	0.33	0.34	0.55	0.53	0.55	0.56	0.57	5.74
Misc. Equip.	1.41	1.35	1.60	1.54	1.47	1.54	1.50	1.57	1.48	1.45	1.43	1.50	17.82
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.28	4.23	5.11	4.87	4.51	4.87	4.67	4.95	4.64	4.46	4.47	4.70	55.76
Total	9.89	9.04	10.12	9.45	10.78	13.85	13.75	14.43	12.61	10.12	8.63	10.00	132.67

Gas Consumption (Btu x000,000)

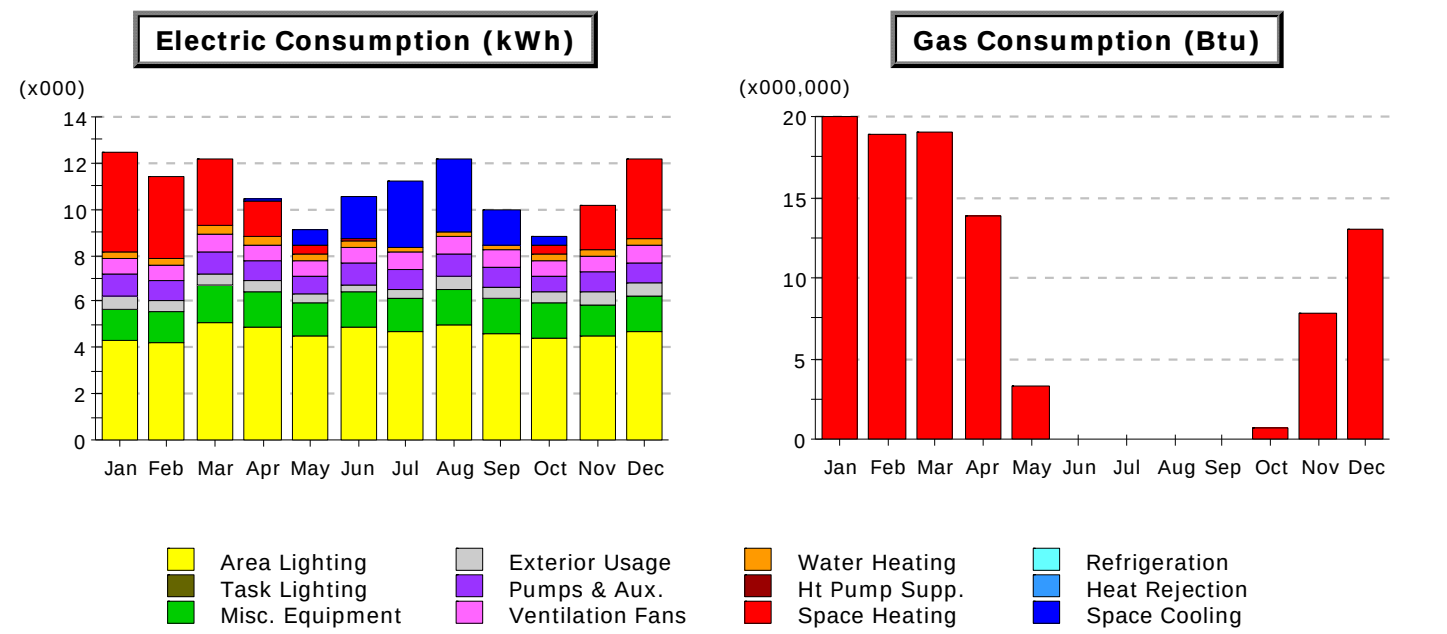
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	128.49	109.16	95.77	59.27	15.71	0.16	-	-	0.24	19.25	62.33	102.65	593.04
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	128.49	109.16	95.77	59.27	15.71	0.16	-	-	0.24	19.25	62.33	102.65	593.04

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.66	0.56	0.56	0.69	2.26	4.77	5.61	5.84	3.84	1.69	0.36	0.67	27.52
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.41	1.11	0.87	0.42	0.14	0.02	0.00	-	0.03	0.20	0.57	1.11	5.89
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.29	0.29	0.34	0.32	0.28	0.28	0.25	0.25	0.23	0.24	0.26	0.29	3.30
Vent. Fans	0.96	0.77	0.85	0.91	1.69	2.04	1.39	1.28	1.82	1.37	0.72	0.83	14.63
Pumps & Aux.	0.45	0.40	0.41	0.33	0.13	0.01	-	-	0.04	0.21	0.37	0.43	2.79
Ext. Usage	0.57	0.44	0.49	0.47	0.34	0.33	0.34	0.55	0.53	0.55	0.56	0.57	5.74
Misc. Equip.	1.41	1.35	1.60	1.54	1.47	1.54	1.50	1.57	1.48	1.45	1.43	1.50	17.82
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.28	4.23	5.11	4.87	4.51	4.87	4.67	4.95	4.64	4.46	4.47	4.70	55.76
Total	10.02	9.16	10.24	9.55	10.81	13.85	13.75	14.43	12.62	10.17	8.73	10.12	133.44

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	108.29	90.68	77.49	46.22	11.23	0.09	-	-	0.18	14.35	49.20	85.33	483.07
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	108.29	90.68	77.49	46.22	11.23	0.09	-	-	0.18	14.35	49.20	85.33	483.07

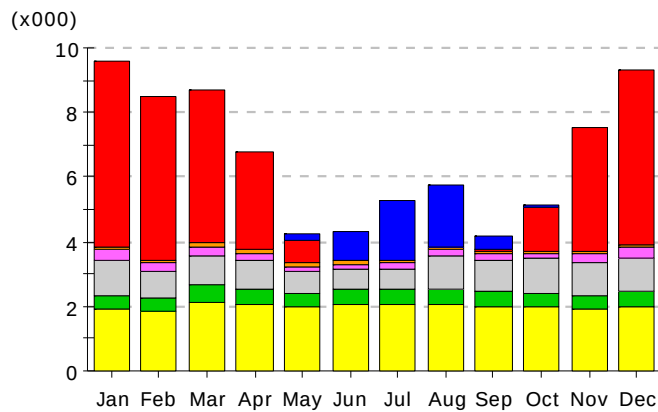
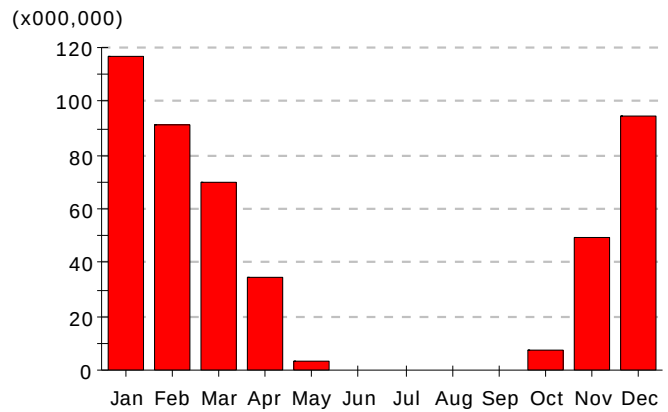


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.06	0.64	1.82	2.82	3.18	1.56	0.34	0.00	-	10.43
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	4.27	3.53	2.89	1.57	0.37	0.08	0.00	-	0.00	0.41	1.92	3.45	18.49
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.29	0.29	0.34	0.32	0.28	0.27	0.24	0.25	0.23	0.24	0.26	0.29	3.29
Vent. Fans	0.71	0.68	0.79	0.75	0.73	0.74	0.73	0.76	0.71	0.72	0.70	0.73	8.76
Pumps & Aux.	0.91	0.86	0.97	0.84	0.76	0.90	0.90	0.95	0.85	0.62	0.80	0.93	10.29
Ext. Usage	0.57	0.44	0.49	0.47	0.34	0.33	0.34	0.55	0.53	0.55	0.56	0.57	5.74
Misc. Equip.	1.41	1.35	1.60	1.54	1.47	1.54	1.50	1.57	1.48	1.45	1.43	1.50	17.82
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.28	4.23	5.11	4.87	4.51	4.87	4.67	4.95	4.64	4.46	4.47	4.70	55.76
Total	12.45	11.37	12.19	10.42	9.08	10.54	11.21	12.21	10.01	8.79	10.14	12.18	130.58

Gas Consumption (Btu x000,000)

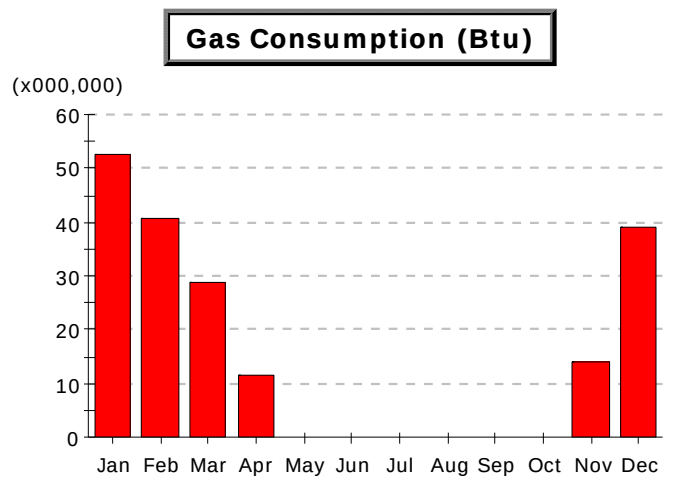
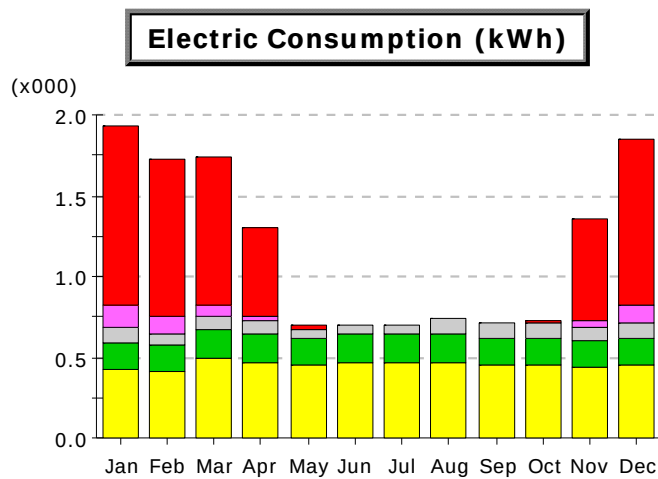
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	19.98	18.89	19.00	13.83	3.30	-	-	-	-	0.66	7.78	13.03	96.47
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19.98	18.89	19.00	13.83	3.30	-	-	-	-	0.66	7.78	13.03	96.47

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.01	0.23	0.87	1.84	1.96	0.44	0.07	-	-	5.41
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	5.74	5.04	4.75	3.01	0.72	0.03	0.00	-	0.07	1.35	3.84	5.39	29.93
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.10	0.10	0.11	0.10	0.09	0.09	0.08	0.08	0.08	0.08	0.09	0.10	1.11
Vent. Fans	0.34	0.29	0.28	0.22	0.17	0.16	0.17	0.16	0.16	0.18	0.24	0.31	2.70
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	1.08	0.83	0.92	0.89	0.63	0.61	0.63	1.03	1.00	1.03	1.04	1.08	10.77
Misc. Equip.	0.43	0.41	0.48	0.47	0.45	0.47	0.47	0.47	0.45	0.45	0.43	0.45	5.42
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.90	1.83	2.15	2.07	1.98	2.07	2.06	2.08	1.99	1.98	1.91	2.00	24.03
Total	9.59	8.50	8.70	6.76	4.28	4.30	5.26	5.77	4.19	5.15	7.56	9.33	79.38

Gas Consumption (Btu x000,000)

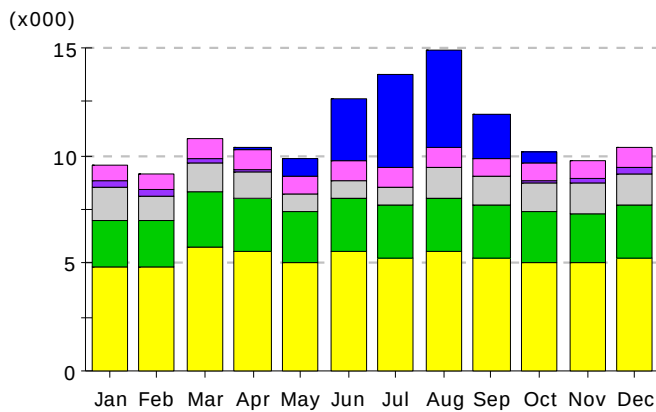
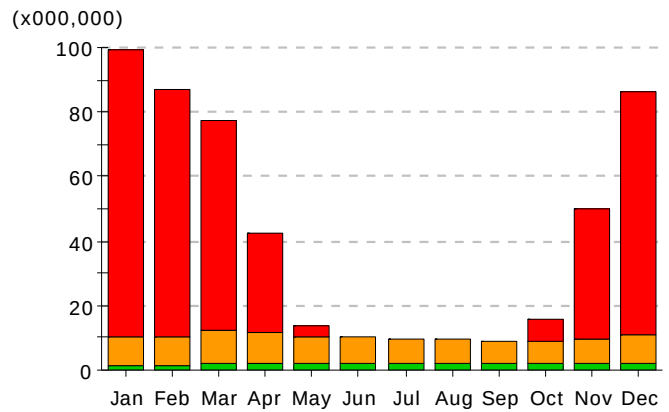
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	116.99	91.43	69.47	34.47	2.91	-	-	-	-	7.47	49.12	94.77	466.62
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	116.99	91.43	69.47	34.47	2.91	-	-	-	-	7.47	49.12	94.77	466.62

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.11	0.98	0.91	0.55	0.02	-	-	-	-	0.01	0.63	1.03	5.25
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.14	0.10	0.07	0.03	0.00	-	-	-	-	0.00	0.03	0.10	0.47
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	0.10	0.07	0.08	0.08	0.06	0.05	0.06	0.09	0.09	0.09	0.09	0.10	0.95
Misc. Equip.	0.16	0.16	0.18	0.18	0.17	0.18	0.18	0.18	0.17	0.17	0.16	0.17	2.05
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.43	0.41	0.49	0.47	0.45	0.47	0.47	0.47	0.45	0.45	0.43	0.45	5.44
Total	1.93	1.73	1.74	1.30	0.70	0.70	0.70	0.74	0.71	0.72	1.35	1.85	14.16

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	52.53	40.72	28.59	11.44	0.20	-	-	-	-	0.06	14.15	39.12	186.81
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	52.53	40.72	28.59	11.44	0.20	-	-	-	-	0.06	14.15	39.12	186.81

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.08	0.82	2.87	4.38	4.61	2.03	0.49	0.01	-	15.31
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.78	0.78	0.94	0.90	0.82	0.90	0.86	0.90	0.86	0.82	0.82	0.86	10.25
Pumps & Aux.	0.33	0.29	0.28	0.18	0.02	-	-	-	0.00	0.07	0.22	0.31	1.72
Ext. Usage	1.47	1.13	1.25	1.21	0.86	0.83	0.86	1.40	1.36	1.40	1.42	1.47	14.66
Misc. Equip.	2.21	2.17	2.60	2.49	2.31	2.49	2.40	2.50	2.39	2.31	2.29	2.40	28.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.81	4.78	5.76	5.51	5.05	5.52	5.28	5.52	5.28	5.04	5.04	5.28	62.88
Total	9.60	9.15	10.84	10.37	9.88	12.61	13.79	14.95	11.92	10.14	9.80	10.33	133.38

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	89.26	76.82	64.71	30.59	3.36	0.00	-	-	0.01	6.60	40.66	75.86	387.87
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	8.67	8.84	10.60	9.95	8.50	8.50	7.60	7.54	7.20	7.24	7.79	8.83	101.27
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.67	1.67	2.02	1.93	1.75	1.93	1.84	1.93	1.84	1.75	1.75	1.84	21.92
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	99.59	87.33	77.32	42.47	13.61	10.44	9.44	9.47	9.05	15.60	50.20	86.53	511.06

APPENDIX D

LIGHTING SPREADSHEETS

Appendix D - Lighting Summary

Building	Floor #	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Quantity of Proposed	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without	Proposed kWh With	Proposed Occupancy Sensor Type	Occupancy Sensor	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Borough Hall - Interior	2	Bob Hoffman's Office	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	6	660	0.66	2080	1373	\$203.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	6	558	0.56	2080	1456	1161	812	Ceiling Mounted Occupancy Sensor	1	0.10	560	\$83.21	\$40.0	\$0.0	\$65.0	\$103.0	\$73.5	\$65.0	\$40.0	\$105.0	\$463.5	\$343.0	\$806.5
Borough Hall - Interior	2	Receptionist Area	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	10	1100	1.10	2080	2288	\$339.8	Replace Magnetic Ballast w/ Standard Electronic Ballast	10	930	0.93	2080	1456	1934	1934	None Proposed	0	0.17	354	\$52.51	\$40.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$650.0	\$400.0	\$1,050.0
Borough Hall - Interior	2	Receptionist Area	Recessed Can w/ 2-13W CFL's	2	52	0.05	2080	108	\$16.1	None Proposed	0	52	0.05	2080	1456	108	108	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Closet	Strip Fluorescent - 18" Fluorescent w/ 1 T12 Lamp	1	19	0.02	520	10	\$1.5	Replace T12 Bulb With T8 Bulb, Replace Ballast w/ Standard Electronic Ballast	1	14	0.01	520	364	7	7	None Proposed	0	0.01	3	\$0.39	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0
Borough Hall - Interior	2	Mayor	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	4	440	0.44	2080	915	\$135.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	4	372	0.37	2080	1456	774	542	Ceiling Mounted Occupancy Sensor	1	0.07	374	\$55.47	\$40.0	\$0.0	\$65.0	\$103.0	\$73.5	\$65.0	\$40.0	\$105.0	\$333.5	\$263.0	\$596.5
Borough Hall - Interior	2	Waiting Room	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	4	440	0.44	2080	915	\$135.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	4	372	0.37	2080	1456	774	774	None Proposed	0	0.07	141	\$21.00	\$40.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$260.0	\$160.0	\$420.0
Borough Hall - Interior	2	Kitchen	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	8	880	0.88	2080	1830	\$271.8	Replace Magnetic Ballast w/ Standard Electronic Ballast	8	744	0.74	2080	1456	1548	1083	Automatic Wall Switch Occupancy Sensor	1	0.14	747	\$110.95	\$40.0	\$105.0	\$65.0	\$63.5	\$45.0	\$65.0	\$40.0	\$105.0	\$565.0	\$383.5	\$948.5
Borough Hall - Interior	2	Closet	Strip Fluorescent - 18" Fluorescent w/ 1 T12 Lamp	3	57	0.06	520	30	\$4.4	Replace T12 Bulb With T8 Bulb, Replace Ballast w/ Standard Electronic Ballast	3	42	0.04	520	364	22	22	None Proposed	0	0.02	8	\$1.16	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$195.0	\$120.0	\$315.0
Borough Hall - Interior	2	Parking Authority	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	2	220	0.22	2080	458	\$68.0	Replace Magnetic Ballast w/ Standard Electronic Ballast	2	186	0.19	2080	1456	387	271	Automatic Wall Switch Occupancy Sensor	1	0.03	187	\$27.74	\$40.0	\$0.0	\$65.0	\$63.5	\$45.0	\$65.0	\$40.0	\$105.0	\$175.0	\$143.5	\$318.5
Borough Hall - Interior	-	Stairwell	2X2 Fixtures w/ 3-T12 Lamps w/ Magnetic Ballasts	8	568	0.57	8760	4976	\$736.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	8	480	0.48	8760	6132	4205	4205	None Proposed	0	0.09	771	\$114.48	\$20.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$20.0	\$85.0	\$520.0	\$160.0	\$680.0
Borough Hall - Interior	2	Council Caucus Room	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	8	880	0.88	2080	1830	\$271.8	Replace Magnetic Ballast w/ Standard Electronic Ballast	8	744	0.74	2080	1456	1548	1548	None Proposed	0	0.14	283	\$42.01	\$40.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$520.0	\$320.0	\$840.0
Borough Hall - Interior	2	Storage	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	256.8	0.26	520	134	\$19.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	146	0.15	520	364	76	53	Automatic Wall Switch Occupancy Sensor	1	0.11	80	\$11.94	\$85.0	\$15.0	\$65.0	\$63.5	\$45.0	\$65.0	\$100.0	\$165.0	\$175.0	\$263.5	\$438.5
Borough Hall - Interior	2	Closet	Strip Fluorescent - 18" Fluorescent w/ 1 T12 Lamp	1	19	0.02	520	10	\$1.5	Replace T12 Bulb With T8 Bulb, Replace Ballast w/ Standard Electronic Ballast	1	14	0.01	520	364	7	7	None Proposed	0	0.01	3	\$0.39	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0
Borough Hall - Interior	2	Closet	Strip Fluorescent - 18" Fluorescent w/ 1 T12 Lamp	1	19	0.02	520	10	\$1.5	Replace T12 Bulb With T8 Bulb, Replace Ballast w/ Standard Electronic Ballast	1	14	0.01	520	364	7	7	None Proposed	0	0.01	3	\$0.39	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0
Borough Hall - Interior	2	Closet	Strip Fluorescent - 18" Fluorescent w/ 1 T12 Lamp	1	19	0.02	520	10	\$1.5	Replace T12 Bulb With T8 Bulb, Replace Ballast w/ Standard Electronic Ballast	1	14	0.01	520	364	7	7	None Proposed	0	0.01	3	\$0.39	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0
Borough Hall - Interior	2	Storage	Recessed Can w/ 2-13W CFL's	2	52	0.05	520	27	\$4.0	None Proposed	0	52	0.05	520	364	27	19	Automatic Wall Switch Occupancy Sensor	1	0.00	8	\$1.20	\$0.0	\$0.0	\$0.0	\$63.5	\$45.0	\$0.0	\$0.0	\$0.0	\$45.0	\$63.5	\$108.5
Borough Hall - Interior	2	Womens Bathroom	Recessed Can w/ 2-13W CFL's	2	52	0.05	2080	108	\$16.1	None Proposed	0	52	0.05	2080	1456	108	108	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Womens Bathroom	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	3	256.8	0.26	2080	534	\$79.3	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	3	145.8	0.15	2080	1456	303	303	None Proposed	0	0.11	231	\$34.29	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$195.0	\$240.0	\$435.0
Borough Hall - Interior	2	Womens Bathroom	24" Fluorescent w/ 2 T12 Lamp	1	56	0.06	2080	116	\$17.3	Replace T12 Bulb With T8 Bulb, Replace Ballast w/ Standard Electronic Ballast	1	31	0.03	2080	1456	64	64	None Proposed	0	0.03	52	\$7.72	\$55.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$65.0	\$130.0	\$65.0	\$65.0	\$130.0
Borough Hall - Interior	2	Mens Bathroom	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	4	342.4	0.34	2080	712	\$105.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	4	194.4	0.19	2080	1456	404	404	None Proposed	0	0.15	308	\$45.71	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$280.0	\$320.0	\$598.0
Borough Hall - Interior	2	Mens Bathroom	Recessed Can w/ 2-13W CFL's	2	52	0.05	2080	108	\$16.1	None Proposed	0	52	0.05	2080	1456	108	108	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Council Chamber	Recessed Can w/ (Assume 75W Par 36 Lamp)	25	1875	1.88	2080	3900	\$579.2	Replace 75W Lamp with 23W Par CFL	25	575	0.58	2080	1456	1196	1196	None Proposed	0	1.30	2704	\$401.54	\$0.0	\$20.0	\$20.0	\$0.0	\$0.0	\$20.0	\$20.0	\$40.0	\$500.0	\$500.0	\$1,000.0
Borough Hall - Interior	2	Conference Room	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	6	660	0.66	2080	1373	\$203.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	6	558	0.56	2080	1456	1161	812	Ceiling Mounted Occupancy Sensor	1	0.10	560	\$83.21	\$40.0	\$0.0	\$65.0	\$103.0	\$73.5	\$65.0	\$40.0	\$105.0	\$463.5	\$343.0	\$806.5
Borough Hall - Interior	2	Conference Room	Recessed Can w/ 2-13W CFL's	2	52	0.05	2080	108	\$16.1	None Proposed	0	52	0.05	2080	1456	108	108	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Receptionist Area	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	8	880	0.88	2080	1830	\$271.8	Replace Magnetic Ballast w/ Standard Electronic Ballast	8	744	0.74	2080	1456	1548	1548	None Proposed	0	0.14	283	\$42.01	\$40.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$520.0	\$320.0	\$840.0
Borough Hall - Interior	2	Receptionist Area	Recessed Can w/ 2-13W CFL's	12	312	0.31	2080	649	\$96.4	None Proposed	0	312	0.31	2080	1456	649	649	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Office	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	3	330	0.33	2080	686	\$101.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	3	279	0.28	2080	1456	580	406	Automatic Wall Switch Occupancy Sensor	1	0.05	280	\$41.61	\$40.0	\$105.0	\$65.0	\$63.5	\$45.0	\$65.0	\$40.0	\$105.0	\$240.0	\$183.5	\$423.5
Borough Hall - Interior	2	Closet	Strip Fluorescent - 18" Fluorescent w/ 1 T12 Lamp	1	19	0.02	520	10	\$1.5	Replace T12 Bulb With T8 Bulb, Replace Ballast w/ Standard Electronic Ballast	1	14	0.01	520	364	7	7	None Proposed	0	0.01	3	\$0.39	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0
Borough Hall - Interior	2	Court Administration	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	4	440	0.44	2080	915	\$135.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	4	372	0.37	2080	1456	774	774	None Proposed	0	0.07	141	\$21.00	\$40.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$260.0	\$160.0	\$420.0
Borough Hall - Interior	2	Court Administration	Recessed Can w/ 13W CFL	1	13	0.01	2080	27	\$4.0	None Proposed	0	13	0.01	2080	1456	27	27	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Closet	Strip Fluorescent - 18" Fluorescent w/ 1 T12 Lamp	1	19	0.02	520	10	\$1.5	Replace T12 Bulb With T8 Bulb, Replace Ballast w/ Standard Electronic Ballast	1	14	0.01	520	364	7	7	None Proposed	0	0.01	3	\$0.39	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0
Borough Hall - Interior	2	Closet	Strip Fluorescent - 18" Fluorescent w/ 1 T12 Lamp	1	19	0.02	520	10	\$1.5	Replace T12 Bulb With T8 Bulb, Replace Ballast w/ Standard Electronic Ballast	1	14	0.01	520	364	7	7	None Proposed	0	0.01	3	\$0.39	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0
Borough Hall - Interior	2	Main Lobby	Recessed Can w/ 2-13W CFL's	6	156	0.16	8760	1367	\$202.9	None Proposed	0	156	0.16	8760	6132	1367	1367	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Main Lobby	Interior Fixture - 70W Metal Halide	4	380	0.38	8760	3229	\$494.3	None Proposed	0	380	0.38	8760	6132	3329	3329	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Main Lobby	13W CFL Fixture	2	26	0.03	8760	228	\$33.8	None Proposed	0	26	0.03	8760	6132	228	228	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Mens Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Magnetic Ballasts	3	213	0.21	2080	443	\$65.8	Replace Magnetic Ballast w/ Standard Electronic Ballast	3	180	0.18	2080	1456	374	374	None Proposed	0	0.03	69	\$10.19	\$20.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$20.0	\$85.0	\$195.0	\$60.0	\$255.0
Borough Hall - Interior	2	Mens Bathroom	1x4 Fixtures w/ 2-T8 Lamps w/ Magnetic Ballasts	1	71	0.07	2080	148	\$21.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	1	50.7	0.05	2080	1456	105	105	None Proposed	0	0.02	42	\$6.27	\$20.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$20.0	\$85.0	\$65.0	\$20.0	\$85.0
Borough Hall - Interior	2	Mens Bathroom	Recessed Can w/ 13W CFL	1	13	0.01	2080	27	\$4.0	None Proposed	0	13	0.01	2080	1456	27	27	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	2	Hall	1x4 Fixtures w/ 3-T8 Lamps w/ Magnetic Ballasts	4	440	0.44	8760	3854	\$572.4	Replace Magnetic Ballast w/ Standard Electronic Ballast	4	352	0.35	8760	6132	3084	3084	None Proposed	0	0.09	771	\$114.48	\$40.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$260.0	\$160.0	\$420.0
Borough Hall - Interior	2	Police Meeting Room	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	6	660	0.6																											

Appendix D - Lighting Summary

Building	Floor #	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Quantity of Proposed	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without	Proposed kWh With	Proposed Occupancy Sensor Type	Occupancy Sensor	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Borough Hall - Interior	1	Sargent's Office	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	5	550	0.55	2080	1144	\$169.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	5	465	0.47	2080	1456	967	967	None Proposed	0	0.09	177	\$26.25	\$40.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$325.0	\$200.0	\$525.0
Borough Hall - Interior	1	CFO Office	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	3	330	0.33	2080	686	\$101.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	3	279	0.28	2080	1456	580	406	Automatic Wall Switch Occupancy Sensor	1	0.05	280	\$41.61	\$40.0	\$0.0	\$65.0	\$63.5	\$45.0	\$65.0	\$40.0	\$105.0	\$240.0	\$183.5	\$423.5
Borough Hall - Interior	1	Clerk's Office	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	7	770	0.77	2080	1602	\$237.8	Replace Magnetic Ballast w/ Standard Electronic Ballast	7	651	0.65	2080	1456	1354	1354	None Proposed	0	0.12	248	\$36.76	\$40.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$455.0	\$280.0	\$735.0
Borough Hall - Interior	1	Clerk's Office	Recessed Can w/ 2-13W CFL's	6	156	0.16	2080	324	\$48.2	None Proposed	0	156	0.16	2080	1456	324	324	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Borough Hall - Interior	1	Chief's Office	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	6	660	0.66	2080	1373	\$203.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	6	558	0.56	2080	1456	1161	812	Ceiling Mounted Occupancy Sensor	1	0.10	560	\$83.21	\$40.0	\$0.0	\$65.0	\$103.0	\$73.5	\$65.0	\$40.0	\$105.0	\$463.5	\$343.0	\$806.5
Borough Hall - Interior	1	Communications	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	6	660	0.66	2080	1373	\$203.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	6	558	0.56	2080	1456	1161	812	Ceiling Mounted Occupancy Sensor	1	0.10	560	\$83.21	\$40.0	\$0.0	\$65.0	\$103.0	\$73.5	\$65.0	\$40.0	\$105.0	\$463.5	\$343.0	\$806.5
Borough Hall - Interior	1	DARE	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	4	440	0.44	2080	915	\$135.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	4	372	0.37	2080	1456	774	542	Ceiling Mounted Occupancy Sensor	1	0.07	374	\$55.47	\$40.0	\$0.0	\$65.0	\$103.0	\$73.5	\$65.0	\$40.0	\$105.0	\$333.5	\$263.0	\$596.5
Borough Hall - Interior	1	Hall	2X2 Fixtures w/ 2-T12 Lamps w/ Magnetic Ballasts	6	513.6	0.51	8760	4499	\$668.1	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	6	300	0.30	8760	6132	2628	2628	None Proposed	0	0.21	1871	\$277.86	\$55.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$65.0	\$130.0	\$390.0	\$990.0	\$780.0
Borough Hall - Interior	1	Cel	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.17	2080	356	\$52.9	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	97.2	0.10	2080	1456	202	202	None Proposed	0	0.07	154	\$22.86	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$290.0
Borough Hall - Interior	1	Cel	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.17	2080	356	\$52.9	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	97.2	0.10	2080	1456	202	202	None Proposed	0	0.07	154	\$22.86	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$290.0
Borough Hall - Interior	1	Cel	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.17	2080	356	\$52.9	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	97.2	0.10	2080	1456	202	202	None Proposed	0	0.07	154	\$22.86	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$290.0
Borough Hall - Interior	1	Holding Hall	2X2 Fixtures w/ 2-T12 Lamps w/ Magnetic Ballasts	4	342.4	0.34	2080	712	\$105.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	4	200	0.20	2080	1456	416	416	None Proposed	0	0.14	296	\$43.98	\$55.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$65.0	\$130.0	\$260.0	\$260.0	\$520.0
Borough Hall - Interior	1	ID Room	2X4 Fixtures w/ 3-T8 Lamps w/ Magnetic Ballasts	2	220	0.22	2080	458	\$68.0	Replace Magnetic Ballast w/ Standard Electronic Ballast	2	176	0.18	2080	1456	366	366	None Proposed	0	0.04	92	\$13.59	\$40.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$130.0	\$80.0	\$210.0
Borough Hall - Interior	1	Police Garage	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	11	941.6	0.94	2080	1959	\$290.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	11	534.6	0.53	2080	1456	1112	1112	None Proposed	0	0.41	847	\$125.71	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$715.0	\$880.0	\$1,595.0
Borough Hall - Interior	1	Police Garage Attic	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.09	2080	178	\$26.4	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	48.6	0.05	2080	1456	101	101	None Proposed	0	0.04	77	\$11.43	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Borough Hall - Interior	1	Interrogation Room	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	256.8	0.26	2080	534	\$79.3	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	146	0.15	2080	1456	304	213	Automatic Wall Switch Occupancy Sensor	1	0.11	322	\$47.75	\$85.0	\$15.0	\$65.0	\$63.5	\$45.0	\$65.0	\$100.0	\$165.0	\$175.0	\$263.5	\$438.5
Borough Hall - Interior	1	Records	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	7	770	0.77	2080	1602	\$237.8	Replace Magnetic Ballast w/ Standard Electronic Ballast	7	651	0.65	2080	1456	1354	948	Ceiling Mounted Occupancy Sensor	1	0.12	654	\$97.08	\$40.0	\$0.0	\$65.0	\$103.0	\$73.5	\$65.0	\$40.0	\$105.0	\$528.5	\$383.0	\$911.5
Borough Hall - Interior	1	Sargent's Office	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	4	440	0.44	2080	915	\$135.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	4	372	0.37	2080	1456	774	542	Automatic Wall Switch Occupancy Sensor	1	0.07	374	\$55.47	\$40.0	\$0.0	\$65.0	\$63.5	\$45.0	\$65.0	\$40.0	\$105.0	\$305.0	\$223.5	\$528.5
Borough Hall - Interior	1	Detective Bureau	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	6	660	0.66	2080	1373	\$203.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	6	558	0.56	2080	1456	1161	812	Ceiling Mounted Occupancy Sensor	1	0.10	570	\$83.21	\$40.0	\$0.0	\$65.0	\$103.0	\$73.5	\$65.0	\$40.0	\$105.0	\$463.5	\$343.0	\$806.5
Borough Hall - Interior	1	Closet	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	42.8	0.04	520	22	\$3.3	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	24.32	0.02	520	364	13	13	None Proposed	0	0.02	10	\$1.43	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0
Borough Hall - Interior	-	Stairwell	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.09	2080	178	\$26.4	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	48.6	0.05	2080	1456	101	101	None Proposed	0	0.04	77	\$11.43	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Borough Hall - Interior	0	Computer Room	1x4 Fixtures w/ 2-T12 Lamp Bulbs w/ Magnetic Ballast	6	513.6	0.51	2080	1068	\$158.6	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	6	291.6	0.29	2080	1456	607	425	Ceiling Mounted Occupancy Sensor	1	0.22	644	\$95.59	\$70.0	\$10.0	\$65.0	\$103.0	\$73.5	\$65.0	\$80.0	\$145.0	\$463.5	\$583.0	\$1,046.5
Borough Hall - Interior	0	Hall	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	7	599.2	0.60	8760	5249	\$779.5	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	7	340.2	0.34	8760	6132	2980	2980	None Proposed	0	0.26	2269	\$386.92	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$455.0	\$560.0	\$1,015.0
Borough Hall - Interior	0	Boiler Room	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	3	256.8	0.26	2080	534	\$79.3	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	3	145.8	0.15	2080	1456	303	303	None Proposed	0	0.11	231	\$34.29	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$195.0	\$240.0	\$435.0
Borough Hall - Interior	0	Armor Room	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.17	2080	356	\$52.9	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	97.2	0.10	2080	1456	202	142	Automatic Wall Switch Occupancy Sensor	1	0.07	215	\$31.86	\$70.0	\$10.0	\$65.0	\$63.5	\$45.0	\$65.0	\$80.0	\$145.0	\$175.0	\$223.5	\$398.5
Borough Hall - Interior	0	Telephone Room	1x4 Fixtures w/ 2-T12 Lamp Bulbs w/ Magnetic Ballast	4	342.4	0.34	2080	712	\$105.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	4	194.4	0.19	2080	1456	404	283	Automatic Wall Switch Occupancy Sensor	1	0.15	429	\$63.73	\$70.0	\$10.0	\$65.0	\$63.5	\$45.0	\$65.0	\$80.0	\$145.0	\$305.0	\$383.5	\$688.5
Borough Hall - Interior	0	Police Auxiliary Room	2X2 Troffers w/ 3-T8 Lamps w/ Magnetic Ballasts	10	1100	1.10	2080	2288	\$339.8	Replace Magnetic Ballast w/ Standard Electronic Ballast	10	930	0.93	2080	1456	1934	1554	Ceiling Mounted Occupancy Sensor	1	0.17	934	\$138.69	\$40.0	\$0.0	\$65.0	\$103.0	\$73.5	\$65.0	\$40.0	\$105.0	\$723.5	\$503.0	\$1,226.5
Borough Hall - Interior	0	Police Office	2X2 Fixtures w/ 2-T8 Lamps w/ Magnetic Ballasts	2	142	0.14	2080	295	\$43.9	Replace Magnetic Ballast w/ Standard Electronic Ballast	2	120	0.12	2080	1456	250	175	Automatic Wall Switch Occupancy Sensor	1	0.02	121	\$17.92	\$20.0	\$0.0	\$65.0	\$63.5	\$45.0	\$65.0	\$20.0	\$85.0	\$175.0	\$103.5	\$278.5
Borough Hall - Interior	0	Auxiliary Locker Room	100W Incandescent Fixture	2	200	0.20	2080	416	\$61.8	Replace 100W Incandescent Fixture with 25W CFL	2	50	0.05	2080	1456	104	73	Automatic Wall Switch Occupancy Sensor	1	0.15	343	\$50.97	\$0.0	\$7.0	\$20.0	\$63.5	\$45.0	\$20.0	\$7.0	\$27.0	\$85.0	\$77.5	\$162.5
Borough Hall - Interior	0	Closet	Interior Fixture - 75W Incandescent Fixture	1	75	0.08	520	39	\$5.8	Replace 75W Incandescent Fixture with 13W CFL	1	13	0.01	520	364	7	7	None Proposed	0	0.06	32	\$4.79	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Borough Hall - Interior	0	Closet	Interior Fixture - 75W Incandescent Fixture	1	75	0.08	520	39	\$5.8	Replace 75W Incandescent Fixture with 13W CFL	1	13	0.01	520	364	7	7	None Proposed	0	0.06	32	\$4.79	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Borough Hall - Interior	0	Closet	60W Incandescent Fixture	1	60	0.06	520	31	\$4.6	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.01	520	364	7	7	None Proposed	0	0.05	24	\$3.63	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Borough Hall - Interior	0	Archive Room	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.17	2080	356	\$52.9	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	97.2	0.10	2080	1456	202	142	Automatic Wall Switch Occupancy Sensor	1	0.07	215	\$31.86	\$70.0	\$10.0	\$65.0	\$63.5	\$45.0	\$65.0	\$80.0	\$145.0	\$175.0	\$223.5	\$398.5
Borough Hall - Interior	0	Zoning Office	2x4 Fixtures w/ 2-T12 Lamp Bulbs w/ Magnetic Ballast	2	171.2	0.17	2080	356	\$52.9	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	97.2	0.10	2080	1456	202	142	Automatic Wall Switch Occupancy Sensor	1	0.07	215	\$31.86	\$70.0	\$10.0	\$65.0	\$63.5	\$45.0	\$65.0	\$80.0	\$145.0	\$175.0	\$223.5	\$398.5
Borough Hall - Interior	0	File Storage	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	4	342.4	0.34	2080	712	\$105.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	4	194.4	0.19	2080	1456	404	404	None Proposed	0	0.15	308	\$45.71	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$260.0	\$320.0	\$580.0
Borough Hall - Interior	0	File Storage Closet	1X4 Fixtures w/ 1-T8 Lamps w/ Magnetic Ballasts	1	35	0.04	2080	73	\$10.8	Replace Magnetic Ballast w/ Standard Electronic Ballast	1	25.4	0.03	2080	1456	53	53	None Proposed	0	0.01	20	\$2.97	\$20.0	\$0.0	\$65.0	\$0.0	\$0.0	\$65.0	\$20.0	\$85.0	\$65.0	\$20.0	\$85.0
Borough Hall - Interior	0	Construction Code Office	2X2 Fixtures w/ 2-T12 Lamps w/ Magnetic Ballasts	6	513.6	0.51	2080	1068	\$158.6	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	6	300	0.30	2080	1456	624	437	Automatic Wall Switch Occupancy Sensor	1	0.21	631	\$93.78	\$55.0	\$10.0	\$65.0	\$63.5	\$45.0	\$					

Appendix D - Lighting Summary

Building	Floor #	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Quantity of Proposed	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without	Proposed kWh With	Proposed Occupancy Sensor Type	Occupancy Sensor	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Public Library - Interior	1	Rm. 113	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	6	770.4	0.77	2080	1602	\$295.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	6	438	0.44	2080	1456	911	638	Ceiling Mounted Occupancy Sensor	1	0.33	965	\$178.08	\$85.0	\$15.0	\$65.0	\$103.0	\$73.5	\$65.0	\$100.0	\$185.0	\$463.5	\$703.0	\$1,166.5
Public Library - Interior	1	Center Book Area	2x4 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	16	2739.2	2.74	2080	5698	\$1,051.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	16	1556.8	1.56	2080	1456	3238	3238	None Proposed	0	1.18	2459	\$454.00	\$105.0	\$20.0	\$65.0	\$0.0	\$0.0	\$65.0	\$125.0	\$190.0	\$1,040.0	\$2,000.0	\$3,040.0
Public Library - Interior	1	Storage	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.09	520	45	\$8.2	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	48.6	0.05	520	364	25	25	None Proposed	0	0.04	19	\$3.55	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Public Library - Interior	-	Stairwell	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.09	8760	750	\$138.4	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	48.6	0.05	8760	6132	426	426	None Proposed	0	0.04	324	\$59.83	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Public Library - Interior	2	Attic	60W Incandescent Fixture	3	180	0.18	520	94	\$17.3	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.04	520	364	20	20	None Proposed	0	0.14	73	\$13.53	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$60.0	\$15.0	\$75.0
Public Library - Interior	0	Fire Alarm Room	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.09	2080	178	\$32.9	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	48.6	0.05	2080	1456	101	101	None Proposed	0	0.04	77	\$14.21	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Public Library - Interior	0	Multi-Purpose Room	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	11	941.6	0.94	2080	1959	\$361.5	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	11	534.9	0.53	2080	1456	1112	778	Ceiling Mounted Occupancy Sensor	1	0.41	1180	\$217.86	\$70.0	\$10.0	\$65.0	\$103.0	\$73.5	\$65.0	\$80.0	\$145.0	\$788.5	\$983.0	\$1,771.5
Public Library - Interior	0	Mechanical Room	60W Incandescent Fixture	3	180	0.18	2080	374	\$69.1	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.04	2080	1456	81	81	None Proposed	0	0.14	293	\$54.14	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$60.0	\$15.0	\$75.0
Public Library - Interior	-	Stairwell	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	3	256.8	0.26	8760	2250	\$415.3	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	3	145.8	0.15	8760	6132	1277	1277	None Proposed	0	0.11	872	\$179.50	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$195.0	\$240.0	\$435.0
Public Library - Interior	0	Hall	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	5	428	0.43	8760	3749	\$692.1	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	5	243	0.24	8760	6132	2129	2129	None Proposed	0	0.19	1621	\$299.16	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$400.0	\$525.0	
Public Library - Interior	0	Womens Bathroom	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	3	256.8	0.26	2080	534	\$98.6	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	3	145.8	0.15	2080	1456	303	212	Automatic Wall Switch Occupancy Sensor	1	0.11	322	\$59.42	\$70.0	\$10.0	\$65.0	\$63.5	\$45.0	\$65.0	\$80.0	\$145.0	\$240.0	\$303.5	\$543.5
Public Library - Interior	0	Mens Bathroom	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	3	256.8	0.26	2080	534	\$98.6	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	3	145.8	0.15	2080	1456	303	212	Automatic Wall Switch Occupancy Sensor	1	0.11	322	\$59.42	\$70.0	\$10.0	\$65.0	\$63.5	\$45.0	\$65.0	\$80.0	\$145.0	\$240.0	\$303.5	\$543.5
Public Library - Interior	-	Stairwell	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.17	8760	1500	\$276.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	97.2	0.10	8760	6132	851	851	None Proposed	0	0.07	648	\$119.67	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$290.0
Public Library - Interior	-	Stairwell	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	342.4	0.34	8760	2999	\$553.7	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	194.6	0.19	8760	6132	1705	1705	None Proposed	0	0.15	1295	\$239.01	\$105.0	\$20.0	\$65.0	\$0.0	\$0.0	\$65.0	\$125.0	\$190.0	\$130.0	\$250.0	\$380.0
Public Library - Interior	-1	Community Room	2x4 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	13	2225.6	2.23	2080	4629	\$854.6	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	13	1264.9	1.26	2080	1456	2631	1842	Ceiling Mounted Occupancy Sensor	1	0.96	2788	\$514.58	\$105.0	\$20.0	\$65.0	\$103.0	\$73.5	\$65.0	\$80.0	\$145.0	\$918.5	\$1,728.0	\$2,646.5
Public Library - Interior	-1	Storage	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.17	520	89	\$16.4	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	2	97.2	0.10	520	364	51	35	Automatic Wall Switch Occupancy Sensor	1	0.07	54	\$9.90	\$70.0	\$10.0	\$65.0	\$63.5	\$45.0	\$65.0	\$80.0	\$145.0	\$175.0	\$223.5	\$398.5
Public Library - Interior	1	Hall	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	4	513.6	0.51	8760	4499	\$830.5	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	4	292	0.29	8760	6132	2558	2558	None Proposed	0	0.22	1941	\$358.35	\$85.0	\$15.0	\$65.0	\$0.0	\$0.0	\$65.0	\$100.0	\$165.0	\$260.0	\$400.0	\$660.0
Public Library - Interior	-	Exit Signs	CFL Exit Sign	10	160	0.16	2080	333	\$61.4	Replace CFL Exit Sign with LED Exit Sign	10	50	0.05	2080	1456	104	104	None Proposed	0	0.11	229	\$42.24	\$0.0	\$61.0	\$63.0	\$0.0	\$0.0	\$63.0	\$61.0	\$124.0	\$630.0	\$610.0	\$1,240.0
Public Library - Exterior	-	Building Mounted	Incandescent Par 38 w/ 2 75W Lamp	3	450	0.45	4380	1971	\$363.8	Replace 75W Lamp with 23W Par CFL	3	138	0.14	4380	3066	604	604	None Proposed	0	0.31	1367	\$252.27	\$0.0	\$20.0	\$20.0	\$0.0	\$0.0	\$20.0	\$20.0	\$40.0	\$60.0	\$60.0	\$120.0
Public Library - Exterior	-	Building Mounted	100W Incandescent Fixture	4	400	0.40	4380	1752	\$323.4	Replace 100W Incandescent Fixture with 25W CFL	4	100	0.10	4380	3066	438	438	None Proposed	0	0.30	1314	\$242.56	\$0.0	\$7.0	\$20.0	\$0.0	\$0.0	\$20.0	\$7.0	\$27.0	\$80.0	\$28.0	\$108.0
Public Library - Exterior	-	Parking Lot	Exterior Fixture - (Assume 150W High Pressure Sodium)	5	945	0.95	4380	4139	\$764.1	Replace 150W High Pressure Sodium Fixture with Induction Area Light	5	425	0.43	4380	3066	1862	1862	None Proposed	0	0.52	2278	\$420.44	\$0.0	\$440.0	\$134.0	\$0.0	\$0.0	\$134.0	\$440.0	\$574.0	\$670.0	\$2,200.0	\$2,870.0
DPW Main Building - Interior	1	Garage	1x8 Fixtures w/ 4-T12 Lamp Bulbs w/ Magnetic Ballast	21	395.2	3.60	2080	7478	\$1,109.0	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	21	2043.3	2.04	2080	1456	4250	4250	None Proposed	0	1.55	3228	\$478.71	\$105.0	\$20.0	\$65.0	\$0.0	\$0.0	\$65.0	\$125.0	\$190.0	\$1,365.0	\$2,625.0	\$3,990.0
DPW Main Building - Interior	1	Garage	1x8 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	5	640	0.64	2080	1331	\$197.4	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	5	243	0.24	2080	1456	505	505	None Proposed	0	0.40	826	\$122.46	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$400.0	\$525.0	
DPW Main Building - Interior	1	Garage	Interior Fixture - 70W Metal Halide	1	95	0.10	2080	198	\$29.3	None Proposed	0	95	0.10	2080	1456	198	198	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
DPW Main Building - Interior	1	Office	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	5	856	0.86	2080	1780	\$264.0	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	5	486.5	0.49	2080	1456	1012	708	Automatic Wall Switch Occupancy Sensor	1	0.37	1072	\$159.00	\$105.0	\$20.0	\$65.0	\$63.5	\$45.0	\$65.0	\$125.0	\$190.0	\$370.0	\$688.5	\$1,058.5
DPW Main Building - Interior	1	Storage	Circine Fixture w/ 2-T8 Lamps	1	50	0.05	520	26	\$3.9	None Proposed	0	50	0.05	520	364	26	26	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
DPW Main Building - Interior	1	Stairwell	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.09	2080	178	\$26.4	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	48.6	0.05	2080	1456	101	101	None Proposed	0	0.04	77	\$11.41	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
DPW Main Building - Interior	2	Recreation Room	1x4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.03	2080	53	\$7.8	None Proposed	0	25.4	0.03	2080	1456	53	37	Ceiling Mounted Occupancy Sensor	1	0.00	16	\$2.35	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
DPW Main Building - Interior	2	Recreation Room	2x4 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	6	1027.2	1.03	2080	2137	\$316.9	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	6	583.8	0.58	2080	1456	1214	1214	None Proposed	0	0.44	922	\$136.77	\$105.0	\$20.0	\$65.0	\$0.0	\$0.0	\$65.0	\$125.0	\$190.0	\$390.0	\$750.0	\$1,140.0
DPW Main Building - Interior	1	Kitchen	2x4 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	4	684.8	0.68	2080	1424	\$211.2	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	4	389.2	0.39	2080	1456	810	567	Ceiling Mounted Occupancy Sensor	1	0.30	858	\$127.20	\$105.0	\$20.0	\$65.0	\$103.0	\$73.5	\$65.0	\$125.0	\$190.0	\$333.5	\$603.0	\$936.5
DPW Main Building - Interior	1	Womens Bathroom	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.05	2080	105	\$15.6	None Proposed	0	50.7	0.05	2080	1456	105	105	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
DPW Main Building - Interior	1	Mens Bathroom	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.05	2080	105	\$15.6	None Proposed	0	50.7	0.05	2080	1456	105	105	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
DPW Main Building - Interior	-	Exit Signs	CFL Exit Sign	5	80	0.08	2080	166	\$24.7	Replace CFL Exit Sign with LED Exit Sign	5	25	0.03	2080	1456	52	52	None Proposed	0	0.06	114	\$16.97	\$0.0	\$61.0	\$63.0	\$0.0	\$0.0	\$63.0	\$61.0	\$124.0	\$315.0	\$305.0	\$620.0
DPW Main Building - Exterior	1	Building Mounted	Exterior Fixture - (Assume 150W High Pressure Sodium)	2	379	0.38	4380	1656	\$245.5	Replace 150W High Pressure Sodium Fixture with Induction Area Light	2	170	0.17	4380	3066	745	745	None Proposed	0	0.21	911	\$135.11	\$0.0	\$440.0	\$134.0	\$0.0	\$0.0	\$134.0	\$440.0	\$574.0	\$268.0	\$880.0	\$1,148.0
DPW Main Building - Exterior	1	Building Mounted	Incandescent Par 38 w/ 2 75W Lamp	2	300	0.30	4380	1314	\$194.9	Replace 75W Lamp with 23W Par CFL	2	92	0.09	4380	3066	403	403	None Proposed	0	0.21	911	\$135.11	\$0.0	\$20.0	\$20.0	\$0.0	\$0.0	\$20.0	\$20.0	\$40.0	\$40.0	\$80.0	
DPW Main Building - Exterior	1	Building Mounted	Incandescent Par 38 w/ 3 75W Lamp	2	450	0.45	4380	1971	\$292.3	Replace 75W Lamp with 23W Par CFL	2	138	0.14	4380	3066	604	604	None Proposed	0	0.31	1367	\$202.66	\$0.0	\$20.0	\$20.0	\$0.0	\$0.0	\$20.0	\$20.0	\$40.0	\$40.0	\$80.0	
DPW Main Building - Exterior	1	Parking Lot	Exterior Fixture - 400W Metal Halide	5	2290	2.29	4380	10030	\$1,487.5	Replace 400W Metal Halide Fixture with Induction Area Light	5	1075	1.08	4380	3066	4709	4709	None Proposed	0	1.22	5322	\$789.21	\$0.0	\$485.0	\$134.0	\$139.0	\$0.0	\$0.0	\$134.0				

Appendix D - Lighting Summary

Building	Floor #	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Quantity of Proposed	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without	Proposed kWh With	Proposed Occupancy Sensor Type	Occupancy Sensor	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Fire Department - Interior	1	Garage	1x4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.05	2080	106	\$15.6	None Proposed	0	50.8	0.05	2080	1456	106	106	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Fire Department - Interior	1	Hall	Recessed Can w/ 2-13W CFL's	10	260	0.26	2080	541	\$79.9	None Proposed	0	260	0.26	2080	1456	541	379	Ceiling Mounted Occupancy Sensor	2	0.00	162	\$23.98	\$0.0	\$0.0	\$0.0	\$206.0	\$147.0	\$0.0	\$0.0	\$0.0	\$294.0	\$412.0	\$706.0
Fire Department - Interior	1	Hose Storage	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.30	520	158	\$23.4	None Proposed	0	304.2	0.30	520	364	158	111	Automatic Wall Switch Occupancy Sensor	1	0.00	47	\$7.01	\$0.0	\$0.0	\$0.0	\$63.5	\$45.0	\$0.0	\$0.0	\$0.0	\$45.0	\$63.5	\$108.5
Fire Department - Interior	1	Rm. 204	2x4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.09	2080	183	\$27.1	None Proposed	0	88	0.09	2080	1456	183	183	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Fire Department - Interior	1	Records/Computer Room	2x4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.18	2080	366	\$54.1	None Proposed	0	176	0.18	2080	1456	366	366	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Fire Department - Interior	1	Fire Communications	2x2 Troffers w/ 3-T8 Lamps w/ Electronic Ballasts	4	372	0.37	2080	774	\$114.4	None Proposed	0	372	0.37	2080	1456	774	774	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Fire Department - Interior	1	Mechanical Room	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.15	2080	316	\$46.8	None Proposed	0	152.1	0.15	2080	1456	316	221	Automatic Wall Switch Occupancy Sensor	1	0.00	95	\$14.03	\$0.0	\$0.0	\$0.0	\$63.5	\$45.0	\$0.0	\$0.0	\$0.0	\$45.0	\$63.5	\$108.5
Fire Department - Interior	1	Rm. 110	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.15	2080	316	\$46.8	None Proposed	0	152.1	0.15	2080	1456	316	221	Automatic Wall Switch Occupancy Sensor	1	0.00	95	\$14.03	\$0.0	\$0.0	\$0.0	\$63.5	\$45.0	\$0.0	\$0.0	\$0.0	\$45.0	\$63.5	\$108.5
Fire Department - Interior	1	Cascade	2x4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.09	2080	183	\$27.1	None Proposed	0	88	0.09	2080	1456	183	128	Automatic Wall Switch Occupancy Sensor	1	0.00	55	\$8.12	\$0.0	\$0.0	\$0.0	\$63.5	\$45.0	\$0.0	\$0.0	\$0.0	\$45.0	\$63.5	\$108.5
Fire Department - Interior	1	Deliveries	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.05	2080	105	\$15.6	None Proposed	0	50.7	0.05	2080	1456	105	74	Automatic Wall Switch Occupancy Sensor	1	0.00	32	\$4.68	\$0.0	\$0.0	\$0.0	\$63.5	\$45.0	\$0.0	\$0.0	\$0.0	\$45.0	\$63.5	\$108.5
Fire Department - Interior	0	Hall	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.15	2080	316	\$46.8	None Proposed	0	152.1	0.15	2080	1456	316	316	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Fire Department - Interior	0	Electrical Room	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.10	2080	211	\$31.2	None Proposed	0	101.4	0.10	2080	1456	211	211	None Proposed	0	0.00	0	\$0.00	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Fire Department - Interior	0	Storage	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.41	2080	844	\$124.7	None Proposed	0	405.6	0.41	2080	1456	844	591	Ceiling Mounted Occupancy Sensor	1	0.00	253	\$37.41	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Fire Department - Interior	0	Tower Equipment	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.20	2080	422	\$62.3	None Proposed	0	202.8	0.20	2080	1456	422	295	Ceiling Mounted Occupancy Sensor	1	0.00	127	\$18.70	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Fire Department - Interior	0	Storage	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.20	2080	422	\$62.3	None Proposed	0	202.8	0.20	2080	1456	422	295	Ceiling Mounted Occupancy Sensor	1	0.00	127	\$18.70	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Fire Department - Interior	-	Exit Signs	CFL Exit Sign	15	240	0.24	2080	499	\$73.8	Replace CFL Exit Sign with LED Exit Sign	15	75	0.08	2080	1456	156	156	None Proposed	0	0.17	343	\$50.72	\$0.0	\$61.0	\$63.0	\$0.0	\$0.0	\$63.0	\$61.0	\$124.0	\$945.0	\$915.0	\$1,860.0
Fire Department - Exterior	-	Building Mounted	Exterior Fixture - (Assume 70W High Pressure Sodium)	3	282	0.28	2080	587	\$86.7	Replace 70W High Pressure Sodium Fixture with Induction Area Light	3	165	0.17	2080	1456	343	343	None Proposed	0	0.12	243	\$35.97	\$0.0	\$380.0	\$134.0	\$0.0	\$0.0	\$134.0	\$380.0	\$514.0	\$402.0	\$1,140.0	\$1,542.0
Fire Department - Exterior	-	Exterior Canopy	100W Incandescent Fixture	6	600	0.60	2080	1248	\$184.5	Replace 100W Incandescent Fixture with 25W CFL	6	150	0.15	2080	1456	312	312	None Proposed	0	0.45	936	\$138.34	\$0.0	\$7.0	\$20.0	\$0.0	\$0.0	\$20.0	\$7.0	\$27.0	\$120.0	\$42.0	\$162.0
Fire Department - Exterior	-	Exterior Garage	Exterior Fixture - 400W Metal Halide	5	2290	2.29	2080	4763	\$704.0	Replace 400W Metal Halide fixture with Induction Area Light	5	1075	1.08	2080	1456	2236	2236	None Proposed	0	1.22	2527	\$373.52	\$0.0	\$485.0	\$134.0	\$0.0	\$0.0	\$134.0	\$485.0	\$619.0	\$670.0	\$2,425.0	\$3,095.0
Fire Department - Exterior	-	Exterior Parking	Exterior Fixture - 400W Metal Halide	3	1374	1.37	2080	2858	\$422.4	Replace 400W Metal Halide fixture with Induction Area Light	3	645	0.65	2080	1456	1342	1342	None Proposed	0	0.73	1516	\$224.11	\$0.0	\$485.0	\$134.0	\$0.0	\$0.0	\$134.0	\$485.0	\$619.0	\$402.0	\$1,455.0	\$1,857.0

APPENDIX E

SOLAR ENERGY FINANCING WORKSHEET

Borough of Westwood -Borough Hall

Design Goal: Provide
11% of average annual electricity

Existing Conditons

Average Annual Electrical Usage (kWh)	365,200
Current Utility Price (\$/kWh)	\$0.1485

Calculations

Solar Rating (Zip Code: 07728)	4.51 kWh/sq-m/day
Solar Capacity Required (kW)	34.26
Roof Space Needed (sq-ft)	3,426
Annual Solar kWh (PV Watts)	41,170
Net System installation Cost (\$9/kWh)	\$308,340
Electrical Service Modification Cost	\$100,000
Total System Installation Cost	\$408,340
Materials	\$285,838
Labor	\$122,502
Engineers Opinion of Probable Cost	\$510,425

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1485	41,170.0	\$6,113.7	\$27,790	(\$823)	\$33,080.1	\$33,080.1
2	0.1530	40,964.2	\$6,265.7	\$26,960	(\$819)	\$32,405.9	\$65,486.0
3	0.1575	40,759.3	\$6,421.4	\$26,146	(\$815)	\$31,752.3	\$97,238.3
4	0.1623	40,555.5	\$6,580.9	\$25,235	(\$811)	\$31,004.7	\$128,243.0
5	0.1671	40,352.8	\$6,744.5	\$24,355	(\$807)	\$30,292.9	\$158,535.8
6	0.1722	40,151.0	\$6,912.1	\$23,507	(\$803)	\$29,615.7	\$188,151.6
7	0.1773	39,950.2	\$7,083.8	\$22,687	(\$799)	\$28,972.3	\$217,123.9
8	0.1826	39,750.5	\$7,259.9	\$21,897	(\$795)	\$28,361.7	\$245,485.5
9	0.1881	39,551.7	\$7,440.3	\$21,134	(\$791)	\$27,782.9	\$273,268.5
10	0.1938	39,354.0	\$7,625.2	\$20,397	(\$787)	\$27,235.3	\$300,503.7
11	0.1996	39,157.2	\$7,814.7	\$19,686	(\$783)	\$26,717.9	\$327,221.6
12	0.2056	38,961.4	\$8,008.9	\$19,000	(\$779)	\$26,229.9	\$353,451.5
13	0.2117	38,766.6	\$8,207.9	\$18,338	(\$775)	\$25,770.7	\$379,222.1
14	0.2181	38,572.8	\$8,411.8	\$17,699	(\$771)	\$25,339.4	\$404,561.6
15	0.2246	38,379.9	\$8,620.9	\$17,082	(\$768)	\$24,935.5	\$429,497.1
16	0.2314	38,188.0	\$8,835.1	\$955	(\$764)	\$9,026.0	\$438,523.1
17	0.2383	37,997.1	\$9,054.7	\$950	(\$760)	\$9,244.6	\$447,767.8
18	0.2454	37,807.1	\$9,279.7	\$945	(\$756)	\$9,468.7	\$457,236.5
19	0.2528	37,618.1	\$9,510.3	\$940	(\$752)	\$9,698.4	\$466,934.8
20	0.2604	37,430.0	\$9,746.6	\$936	(\$749)	\$9,933.7	\$476,868.6
21	0.2682	37,242.8	\$9,988.8	\$931	(\$745)	\$10,175.0	\$487,043.6
22	0.2763	37,056.6	\$10,237.0	\$926	(\$741)	\$10,422.3	\$497,465.9
23	0.2845	36,871.3	\$10,491.4	\$922	(\$737)	\$10,675.8	\$508,141.7
24	0.2931	36,687.0	\$10,752.1	\$917	(\$734)	\$10,935.6	\$519,077.2
25	0.3019	36,503.5	\$11,019.3	\$913	(\$730)	\$11,201.8	\$530,279.1

Borough of Westwood - Public Library

Design Goal: Provide
16% of average annual electricity

Existing Conditons

Average Annual Electrical Usage (kWh)	127,215
Current Utility Price (\$/kWh)	\$0.1846

Calculations

Solar Rating (Zip Code: 07728)	4.51 kWh/sq-m/day
Solar Capacity Required (kW)	16.84
Roof Space Needed (sq-ft)	1,684
Annual Solar kWh (PV Watts)	20,237
Net System installation Cost (\$9/kWh)	\$151,560
Electrical Service Modification Cost	\$100,000
Total System Installation Cost	\$251,560
Materials	\$176,092
Labor	\$75,468
Engineers Opinion of Probable Cost	\$314,450

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1846	20,237.0	\$3,735.8	\$13,660	(\$405)	\$16,991.0	\$16,991.0
2	0.1901	20,135.8	\$3,828.6	\$13,252	(\$403)	\$16,677.8	\$33,668.7
3	0.1958	20,035.1	\$3,923.7	\$12,852	(\$401)	\$16,375.0	\$50,043.8
4	0.2017	19,935.0	\$4,021.2	\$12,404	(\$399)	\$16,026.7	\$66,070.4
5	0.2078	19,835.3	\$4,121.2	\$11,972	(\$397)	\$15,696.3	\$81,766.7
6	0.2140	19,736.1	\$4,223.6	\$11,555	(\$395)	\$15,383.5	\$97,150.2
7	0.2204	19,637.4	\$4,328.5	\$11,152	(\$393)	\$15,087.7	\$112,238.0
8	0.2270	19,539.2	\$4,436.1	\$10,763	(\$391)	\$14,808.6	\$127,046.6
9	0.2338	19,441.5	\$4,546.3	\$10,388	(\$389)	\$14,545.7	\$141,592.3
10	0.2409	19,344.3	\$4,659.3	\$10,026	(\$387)	\$14,298.6	\$155,890.8
11	0.2481	19,247.6	\$4,775.1	\$9,677	(\$385)	\$14,066.9	\$169,957.7
12	0.2555	19,151.4	\$4,893.7	\$9,340	(\$383)	\$13,850.2	\$183,808.0
13	0.2632	19,055.6	\$5,015.4	\$9,014	(\$381)	\$13,648.3	\$197,456.3
14	0.2711	18,960.3	\$5,140.0	\$8,700	(\$379)	\$13,460.7	\$210,917.0
15	0.2792	18,865.5	\$5,267.7	\$8,397	(\$377)	\$13,287.1	\$224,204.1
16	0.2876	18,771.2	\$5,398.6	\$469	(\$375)	\$5,492.5	\$229,696.5
17	0.2962	18,677.4	\$5,532.8	\$467	(\$374)	\$5,626.2	\$235,322.7
18	0.3051	18,584.0	\$5,670.3	\$465	(\$372)	\$5,763.2	\$241,085.9
19	0.3143	18,491.1	\$5,811.2	\$462	(\$370)	\$5,903.6	\$246,989.5
20	0.3237	18,398.6	\$5,955.6	\$460	(\$368)	\$6,047.6	\$253,037.1
21	0.3334	18,306.6	\$6,103.6	\$458	(\$366)	\$6,195.1	\$259,232.2
22	0.3434	18,215.1	\$6,255.2	\$455	(\$364)	\$6,346.3	\$265,578.5
23	0.3537	18,124.0	\$6,410.7	\$453	(\$362)	\$6,501.3	\$272,079.8
24	0.3643	18,033.4	\$6,570.0	\$451	(\$361)	\$6,660.2	\$278,740.0
25	0.3753	17,943.2	\$6,733.3	\$449	(\$359)	\$6,823.0	\$285,562.9

Borough of Westwood -DPW Main Building

Design Goal: Provide
90% of average annual electricity

Existing Conditons

Average Annual Electrical Usage (kWh)	73,152
Current Utility Price (\$/kWh)	\$0.1483

Calculations

Solar Rating (Zip Code: 07728)	4.51 kWh/sq-m/day
Solar Capacity Required (kW)	55.02
Roof Space Needed (sq-ft)	5,502
Annual Solar kWh (PV Watts)	66,118
Net System installation Cost (\$9/kWh)	\$495,180
Electrical Service Modification Cost	\$100,000
Total System Installation Cost	\$595,180
Materials	\$416,626
Labor	\$178,554
Engineers Opinion of Probable Cost	\$743,975

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1483	66,118.0	\$9,805.3	\$44,630	(\$1,322)	\$53,112.6	\$53,112.6
2	0.1527	65,787.4	\$10,049.0	\$43,296	(\$1,316)	\$52,029.6	\$105,142.1
3	0.1573	65,458.5	\$10,298.7	\$41,990	(\$1,309)	\$50,979.4	\$156,121.6
4	0.1621	65,131.2	\$10,554.6	\$40,527	(\$1,303)	\$49,778.6	\$205,900.2
5	0.1669	64,805.5	\$10,816.9	\$39,114	(\$1,296)	\$48,635.0	\$254,535.2
6	0.1719	64,481.5	\$11,085.7	\$37,751	(\$1,290)	\$47,547.2	\$302,082.3
7	0.1771	64,159.1	\$11,361.2	\$36,435	(\$1,283)	\$46,513.5	\$348,595.8
8	0.1824	63,838.3	\$11,643.5	\$35,166	(\$1,277)	\$45,532.4	\$394,128.2
9	0.1879	63,519.1	\$11,932.8	\$33,940	(\$1,270)	\$44,602.6	\$438,730.8
10	0.1935	63,201.5	\$12,229.4	\$32,757	(\$1,264)	\$43,722.7	\$482,453.5
11	0.1993	62,885.5	\$12,533.3	\$31,616	(\$1,258)	\$42,891.3	\$525,344.8
12	0.2053	62,571.1	\$12,844.7	\$30,514	(\$1,251)	\$42,107.2	\$567,452.1
13	0.2114	62,258.2	\$13,163.9	\$29,451	(\$1,245)	\$41,369.3	\$608,821.3
14	0.2178	61,946.9	\$13,491.0	\$28,424	(\$1,239)	\$40,676.3	\$649,497.6
15	0.2243	61,637.2	\$13,826.3	\$27,434	(\$1,233)	\$40,027.1	\$689,524.8
16	0.2310	61,329.0	\$14,169.9	\$1,533	(\$1,227)	\$14,476.5	\$704,001.3
17	0.2380	61,022.4	\$14,522.0	\$1,526	(\$1,220)	\$14,827.1	\$718,828.4
18	0.2451	60,717.2	\$14,882.8	\$1,518	(\$1,214)	\$15,186.4	\$734,014.8
19	0.2525	60,413.7	\$15,252.7	\$1,510	(\$1,208)	\$15,554.8	\$749,569.5
20	0.2600	60,111.6	\$15,631.7	\$1,503	(\$1,202)	\$15,932.3	\$765,501.8
21	0.2678	59,811.0	\$16,020.2	\$1,495	(\$1,196)	\$16,319.2	\$781,821.0
22	0.2759	59,512.0	\$16,418.3	\$1,488	(\$1,190)	\$16,715.8	\$798,536.9
23	0.2842	59,214.4	\$16,826.3	\$1,480	(\$1,184)	\$17,122.3	\$815,659.2
24	0.2927	58,918.3	\$17,244.4	\$1,473	(\$1,178)	\$17,539.0	\$833,198.2
25	0.3015	58,623.8	\$17,672.9	\$1,466	(\$1,172)	\$17,966.0	\$851,164.2

Borough of Westwood -DPW Garage

Design Goal: Provide
100% of average annual electricity

Existing Conditons

Average Annual Electrical Usage (kWh)	14,093
Current Utility Price (\$/kWh)	\$0.1746

Calculations

Solar Rating (Zip Code: 07728)	4.51 kWh/sq-m/day
Solar Capacity Required (kW)	11.5
Roof Space Needed (sq-ft)	1,150
Annual Solar kWh (PV Watts)	14,094
Net System installation Cost (\$9/kWh)	\$103,500
Electrical Service Modification Cost	\$100,000
Total System Installation Cost	\$203,500
Materials	\$142,450
Labor	\$61,050
Engineers Opinion of Probable Cost	\$254,375

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1746	14,094.0	\$2,460.8	\$9,513	(\$282)	\$11,692.4	\$11,692.4
2	0.1798	14,023.5	\$2,522.0	\$9,229	(\$280)	\$11,470.7	\$23,163.1
3	0.1852	13,953.4	\$2,584.6	\$8,951	(\$279)	\$11,256.3	\$34,419.4
4	0.1908	13,883.6	\$2,648.9	\$8,639	(\$278)	\$11,010.0	\$45,429.4
5	0.1965	13,814.2	\$2,714.7	\$8,338	(\$276)	\$10,776.2	\$56,205.6
6	0.2024	13,745.2	\$2,782.1	\$8,047	(\$275)	\$10,554.4	\$66,760.0
7	0.2085	13,676.4	\$2,851.3	\$7,767	(\$274)	\$10,344.5	\$77,104.5
8	0.2147	13,608.0	\$2,922.1	\$7,496	(\$272)	\$10,146.1	\$87,250.6
9	0.2212	13,540.0	\$2,994.8	\$7,235	(\$271)	\$9,958.8	\$97,209.4
10	0.2278	13,472.3	\$3,069.2	\$6,983	(\$269)	\$9,782.4	\$106,991.8
11	0.2346	13,404.9	\$3,145.4	\$6,739	(\$268)	\$9,616.7	\$116,608.5
12	0.2417	13,337.9	\$3,223.6	\$6,504	(\$267)	\$9,461.3	\$126,069.8
13	0.2489	13,271.2	\$3,303.7	\$6,278	(\$265)	\$9,316.1	\$135,385.9
14	0.2564	13,204.9	\$3,385.8	\$6,059	(\$264)	\$9,180.7	\$144,566.7
15	0.2641	13,138.9	\$3,469.9	\$5,848	(\$263)	\$9,055.0	\$153,621.7
16	0.2720	13,073.2	\$3,556.2	\$327	(\$261)	\$3,621.5	\$157,243.2
17	0.2802	13,007.8	\$3,644.5	\$325	(\$260)	\$3,709.6	\$160,952.8
18	0.2886	12,942.8	\$3,735.1	\$324	(\$259)	\$3,799.8	\$164,752.7
19	0.2972	12,878.0	\$3,827.9	\$322	(\$258)	\$3,892.3	\$168,645.0
20	0.3062	12,813.6	\$3,923.1	\$320	(\$256)	\$3,987.1	\$172,632.1
21	0.3153	12,749.6	\$4,020.5	\$319	(\$255)	\$4,084.3	\$176,716.4
22	0.3248	12,685.8	\$4,120.5	\$317	(\$254)	\$4,183.9	\$180,900.3
23	0.3346	12,622.4	\$4,222.8	\$316	(\$252)	\$4,286.0	\$185,186.2
24	0.3446	12,559.3	\$4,327.8	\$314	(\$251)	\$4,390.6	\$189,576.8
25	0.3549	12,496.5	\$4,435.3	\$312	(\$250)	\$4,497.8	\$194,074.6

Borough of Westwood -Fire Department

Design Goal: Provide

11% of average annual electricity

Existing Conditons

Average Annual Electrical Usage (kWh)	137,840
Current Utility Price (\$/kWh)	\$0.1478

Calculations

Solar Rating (Zip Code: 07728)	4.51 kWh/sq-m/day
Solar Capacity Required (kW)	12.12
Roof Space Needed (sq-ft)	1,212
Annual Solar kWh (PV Watts)	14,565
Net System installation Cost (\$9/kWh)	\$109,080
Electrical Service Modification Cost	\$100,000
Total System Installation Cost	\$209,080
Materials	\$146,356
Labor	\$62,724
Engineers Opinion of Probable Cost	\$261,350

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1478	14,565.0	\$2,152.7	\$9,831	(\$291)	\$11,692.8	\$11,692.8
2	0.1522	14,492.2	\$2,206.2	\$9,538	(\$290)	\$11,454.0	\$23,146.8
3	0.1568	14,419.7	\$2,261.0	\$9,250	(\$288)	\$11,222.5	\$34,369.3
4	0.1615	14,347.6	\$2,317.2	\$8,928	(\$287)	\$10,957.8	\$45,327.1
5	0.1664	14,275.9	\$2,374.8	\$8,616	(\$286)	\$10,705.7	\$56,032.8
6	0.1713	14,204.5	\$2,433.8	\$8,316	(\$284)	\$10,465.8	\$66,498.6
7	0.1765	14,133.5	\$2,494.3	\$8,026	(\$283)	\$10,237.9	\$76,736.5
8	0.1818	14,062.8	\$2,556.3	\$7,747	(\$281)	\$10,021.6	\$86,758.1
9	0.1872	13,992.5	\$2,619.8	\$7,477	(\$280)	\$9,816.6	\$96,574.7
10	0.1928	13,922.5	\$2,684.9	\$7,216	(\$278)	\$9,622.5	\$106,197.2
11	0.1986	13,852.9	\$2,751.6	\$6,965	(\$277)	\$9,439.1	\$115,636.3
12	0.2046	13,783.7	\$2,820.0	\$6,722	(\$276)	\$9,266.2	\$124,902.5
13	0.2107	13,714.7	\$2,890.1	\$6,488	(\$274)	\$9,103.4	\$134,005.9
14	0.2170	13,646.2	\$2,961.9	\$6,262	(\$273)	\$8,950.5	\$142,956.3
15	0.2236	13,577.9	\$3,035.5	\$6,043	(\$272)	\$8,807.2	\$151,763.6
16	0.2303	13,510.0	\$3,110.9	\$338	(\$270)	\$3,178.5	\$154,942.0
17	0.2372	13,442.5	\$3,188.2	\$336	(\$269)	\$3,255.4	\$158,197.5
18	0.2443	13,375.3	\$3,267.5	\$334	(\$268)	\$3,334.3	\$161,531.8
19	0.2516	13,308.4	\$3,348.7	\$333	(\$266)	\$3,415.2	\$164,947.0
20	0.2592	13,241.9	\$3,431.9	\$331	(\$265)	\$3,498.1	\$168,445.1
21	0.2669	13,175.7	\$3,517.2	\$329	(\$264)	\$3,583.0	\$172,028.1
22	0.2750	13,109.8	\$3,604.6	\$328	(\$262)	\$3,670.1	\$175,698.2
23	0.2832	13,044.2	\$3,694.1	\$326	(\$261)	\$3,759.3	\$179,457.6
24	0.2917	12,979.0	\$3,785.9	\$324	(\$260)	\$3,850.8	\$183,308.4
25	0.3004	12,914.1	\$3,880.0	\$323	(\$258)	\$3,944.6	\$187,253.0

APPENDIX F

NEW JERSEY SMART START INCENTIVE WORKSHEETS



2010 Prescriptive Lighting Application

Customer Information

Company	Electric Utility Serving Applicant	Electric Account No.	Installation Date
Facility Address	City	State	Zip
Type of Project ☐ New Construction ☐ Renovation ☐ Equipment Replacement	Size of Building		
Company Mailing Address	City	State	Zip
Contact Person (Name/Title)	Telephone No. ()	Fax No. ()	
Incorporated? ☐ Yes ☐ No ☐ Exempt	Federal Tax ID# or SSN	Email Address	
Incentive Payment to ☐ Customer ☐ Contractor ☐ Other	Please assign payment to contractor/vendor/other indicated below Customer Signature		

Payee Information (must submit W-9 form with application)

Payee Information (must submit W-9 form with application)					Email Address
Company	Contact Name	Incorporated? Yes No	Federal Tax ID#		
Street Address	City	State	Zip	Telephone No. ()	Fax No. ()

Contractor/Vendor Information (if different from Payee)

Contractor/Vendor Information (if different from Payee)					Email Address
Company	Contact Name	Incorporated? ☐ Yes ☐ No	Federal Tax ID#		
Street Address	City	State	Zip	Telephone No. ()	Fax No. ()

Building Type (circle one)

Education-Primary School; Education-Community College; Education-University; Grocery; Medical-Hospital; Medical-Clinic; Lodging Hotel(Guest Rooms); Lodging Motel; Manufacturing-Light Industrial; Office-Large; Office-Small; Restaurant-Sit Down; Restaurant-Fast Food; Retail-3 Story Large; Retail- Single Story Large; Retail-Small; Storage Conditioned; Storage Unconditioned; Warehouse; Other

Prescriptive Lighting Incentive

\$_____ Total Incentive (per attached worksheet calculations)

Note: Prescriptive Lighting Worksheet must accompany this application.

Specific Program Requirements* (These requirements are in addition to the Program Terms and Conditions.)

1. Please refer to the Program Guide for additional applicable technical requirements.
2. Include the manufacturer's specification sheet with the application package and mail or fax directly to the Commercial/Industrial Market Manager.
3. Incentives for T-5 and T-8 lamps with electronic ballasts are available only for fixtures with a Total Harmonic Distortion of $\leq 20\%$.
4. All eligible lighting devices must be UL listed.
5. Requirements for CFL fixtures (must meet all requirements):
 - Fixtures must be new and ENERGY STAR qualified
 - Fixtures must have replaceable electronic ballasts
 - Total Harmonic Distortion (THD) must not exceed 33%
 - Power factor of the ballast must be no less than 90%
 - The manufacturer must warrant all fixtures for a minimum of 3 years. Warranty does not pertain to lamps or photocells not physically part of the fixture.
 - The installer must warrant fixture installation – minimum of 1 yr.
- 5.1 Screw-in PAR 38 or 30 Compact Fluorescent Lamps (CFL) with Aluminum Reflectors replacing existing incandescent fixtures.
 - The lamp must be warranted by the manufacturer for 8,000 hours
 - Total Harmonic Distortion must not exceed 33%
 - Power factor of the ballast must be $\geq 90\%$
6. Pulse Start Metal Halide (including pole-mounted parking lot lighting) must have a 12% minimum wattage reduction.
7. T-5 or T-8 Fixtures replacing incandescent or T-12 fluorescent fixtures greater than 250 watt or High Intensity Discharge shall comply as follows:
 - 7.1 T-5 fixtures replacing T-12 fluorescent or incandescent fixtures 250 watts or greater, or HID fixtures shall have a ballast factor greater than or equal to 1.0; have reflectivity greater than or equal to 91%; have a minimum 2 lamps; and be designated as F54T5 HO.
 - 7.2 T-8 fixtures replacing T-12 fluorescent or incandescent fixtures 250 watts or greater, or HID fixtures shall have a ballast factor greater than or equal to 1.14; have reflectivity greater than or equal to 91%; have a minimum of 4 lamps; and be designated as F32T8, minimum 32 watts.
 - 7.3 Incentives for delamped T-8 lamps with new reflectors are available only for fixtures with a Total Harmonic Distortion of $\leq 20\%$. Electronic ballast replacement required for all eligible delamped fixtures. Eligible delamping can include reduction in linear lamp feet from existing conditions. For example, 1-8' linear fluorescent lamp can be considered as 2-4' linear lamps. U-bend lamps 4' in total length can be considered as 2-F17/T8 lamps.
 - 7.4 Electronic ballast replacement is necessary for all eligible delamped fixtures.
 - 7.5 Reduced wattage T8 (28W/25W 4') (1-4 lamps) retrofit requires lamp and ballast replacement.
8. LED Refrigerated/Freezer Case Lighting must meet NEEP Design Lights Consortium Standards or be on an ENERGY STAR or a SSL Qualified Product list. For new door installations on existing open cases, indicate the number of LED fixtures to be installed. Also indicate "New Door" in the Fixture Type column on the Prescriptive Lighting Worksheet (ie. New Door 5' LED).

Application Checklist (Before submitting your application, please make sure you have signed in the space below and completed the following items.)

- ☐ Payee Information is filled out and a W-9 form of the payee is included
- ☐ Manufacturer's specification sheets for proposed technology are included
- ☐ A copy (all pages) of a recent month's utility bill is included

ACKNOWLEDGEMENT

CUSTOMER'S SIGNATURE _____	By signing, I certify that I have read, understand and agree to the Specific Program Requirements/Terms and Conditions listed on this application form, I will also submit for approval a properly completed application package, which includes this signed application, worksheet (if applicable), manufacturer's specification sheets and complete utility bill (name and address on utility bill must match name and address on application).
----------------------------	---

Prescriptive Lighting Measures and Incentives*

Type of Fixture		Incentive	
Recessed and Surface-Mounted Compact Fluorescents (New Fixtures Replacing Incandescent Fixtures Only): Only available for hard-wired, electronically ballasted new fixtures with rare earth phosphor lamps and 4-pin based tubes (including: twin tube, quad tube, triple tube, 2D or circline lamps), THD$\leq 33\%$ and BF>0.9		\$25 per 1-lamp fixture \$30 per 2-lamp or more fixture	
Screw-in PAR 38 or PAR 30 (CFL) as per 5.1 above		\$7 per lamp replaced	
High-Efficiency Fluorescent Fixtures: For retrofit of T-12 fixtures to T-5 or T-8 with electronic ballasts		\$15 per fixture (1-4 lamps retrofits)	
For replacement of fixtures with new T-5 or T-8 fixtures			
Type of Old Fixture	Wattage of Old Fixture	Type of New Fixture	Incentive Per Fixture Removed
HID, T-12, Incandescent	≥ 1000 Watts	T-5, T-8	\$284
HID, T-12, Incandescent	400-999 Watt	T-5, T-8	\$100
HID, T-12, Incandescent	250-399 Watt	T-5, T-8	\$50
HID only	175-249 Watt	T-5, T-8	\$45
HID only	100-174 Watt	T-5, T-8	\$30
HID only	75-99 Watt	T-5, T-8	\$16
T-12 only	<250 Watt	T-5, T-8 (1 & 2 lamp)	\$25
T-12 only	<250 Watt	T-5, T-8 (3 & 4 lamp)	\$30
For retrofit of T-8 fixtures by permanent delamping & new reflectors are available only for fixtures with a total Harmonic Distortion of $\leq 20\%$. Electronic ballast replacement required for all eligible delamped fixtures.		\$20 per fixture	
New Construction & Complete Renovation		Performance based only	
LED Exit Signs (new fixtures only): For existing facilities with connected load <75 kW For existing facilities with connected load ≥ 75 kW		\$20 per fixture \$10 per fixture	
Pulse Start Metal Halide (for fixtures ≥ 150 watts)		\$25 per fixture (includes parking lot lighting)	
Parking lot low bay - LED		\$45 per fixture	
T-12 to T-8 fixtures by permanent delamping & new reflectors. Electronic ballast replacement is necessary for all eligible delamped fixtures.		\$30 per fixture	
Retrofit of existing 32 watt T-8 system to Reduced Wattage (28W/25W 4')		\$10 per fixture (1-4 lamps)	
LED Refrigerated/Freezer Case Lighting: Incentive for replacement of fluorescent lighting systems in medium or low temperature display cases		\$42 per 5' LED fixture \$65 per 6' LED fixture	
Induction Lighting Fixtures Retrofit of HID		\$50 per HID ($\geq 100W$) fixture retrofitted with induction lamp, power coupler and generator. Replacement unit must use 30% less wattage per fixture than existing HID system	
Replacement of HID		\$70 per HID ($\geq 100W$) fixture with a new induction fixture	

Mail or fax your application package DIRECTLY to the Commercial/Industrial Market Manager.

New Jersey's Clean Energy Program
 c/o TRC Energy Services
 900 Route 9 North, Suite 104 • Woodbridge, NJ 07095
 Phone: 866-657-6278 • Fax: 732-855-0422

Visit our web site: NJCleanEnergy.com/ssb



Program Terms and Conditions

Definitions:

Design Incentives – Incentives that may be offered to design professionals by the Program.

Design Services – Services that may be offered to design professionals under the Program.

Energy-Efficient Measures – Any device eligible to receive a Program Incentive payment through the NJ Clean Energy Commercial and Industrial Program (New Jersey SmartStart Buildings).

New Jersey Utilities – The regulated electric and/or gas utilities in the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.

Administrator – New Jersey Board of Public Utilities, Office of Clean Energy

Participating Customers – Those non-residential electric and/or gas service customers of the New Jersey Utilities who participate in this Program.

Product Installation or Equipment Installation – Installation of the Energy-Efficient Measures.

Market Manager – TRC Energy Services.

Program – The Commercial and Industrial Energy-Efficient Construction Program (New Jersey SmartStart Buildings) offered herein by the New Jersey Board of Public Utilities, Office of Clean Energy pursuant to state regulatory approval under the New Jersey Electric Discount and Energy Competition Act, NJSA 48:3-49, et seq.

Program Incentives – Refers to the amount or level of incentive that the Program provides to Participating Customers pursuant to the Program offered herein (see description under “Incentive Amount” heading).

Program Offer – Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities identified above. Program Incentives for new construction are available only for projects in areas designated for growth in the State Plan. Public school (K-12) new construction projects are exempted from this restriction and are eligible for new Program incentives throughout the State. Customers, or their trade allies, can determine if a location is in a designated growth area by referring to the Smart Growth Locator available from the HMFA website or contact the Market Manager if you are uncertain about project eligibility.

Application and Eligibility Process – The Program pays incentives after the installation of qualified energy efficient measures that were pre-approved (for exceptions to this condition, please refer to “Exceptions for Approval”). In order to be eligible for Program Incentives, a Customer, or an agent (contractor/vendor) authorized by a Customer, must submit a properly completed application package. The package must include an application signed by the customer; a complete (current) utility bill; and technology worksheet and manufacturer’s cut sheets (where appropriate). This information must be submitted to the Market Manager before equipment is installed. Applications for measures that are self installed by customers must be submitted by the customer and not the sales vendor of the measure, however, the customer may elect to assign payment of the incentive to the sales vendor. This application package must be received by the Market Manager on or before December 31, 2010 in order to be eligible for 2010 incentives. The Market Manager will review the application package to determine if the project is eligible for a Program Incentive. If eligible, the Customer will receive an approval letter with the estimated authorized incentive amount and the date by which the equipment must be installed in order for the approval to remain in effect. Upon receipt of an approval letter, the Customer may then proceed to install the equipment listed on the approved application. Equipment installed prior to the date of the Market Manager’s approval letter is not eligible for an incentive. The Market Manager reserves the right to conduct a pre-inspection of the facility prior to the installation of equipment. This will be done prior to the issuance of the approval letter. All equipment must be purchased within 12 months of date of application. **Any Customer and/or agent who purchases equipment prior to the receipt of an incentive approval letter does so at his/her own risk.**

Exceptions for Approval – The Application and Eligibility Process pertains to all projects except for those involving either Unitary HVAC or Motors having an incentive amount less than \$5,000. These measures, at this incentive level, may be installed without prior approval. In addition, but at the sole discretion of the Market Manager, emergency replacement of equipment may not require a prior approval determination and letter. **In such cases, please notify the Market Manager of such emergencies as early as possible, that an application will soon be sent in that was not pre-approved.**

Post Installation Approval – After installation is completed, the Customer, or an agent authorized by the Customer, must finalize and submit an invoice for the purchase of the equipment (material cost must be broken out from labor costs), and any other required documentation as specified on the equipment application or in the Market Manager’s initial approval letter.

Please refer to the Program Guide on the NJCleanEnergy.com/ssb website for the complete Application and Eligibility Process.

The Market Manager reserves the right to verify sales transactions and to have reasonable access to Participating Customer's facility to inspect both pre-existing product or equipment (if applicable) and the Energy-Efficient Measures installed under this Program, either prior to issuing incentives or at a later time.

Energy-Efficient Measures must be installed in buildings located within a New Jersey Utilities' service territory and designated on the Participating Customer's incentive application. Program Incentives are available for qualified Energy-Efficient Measures as listed and described in the Program materials and incentive applications. The Participating Customer must ultimately own the equipment, either through an up-front purchase or at the end of a short-term lease. Design Incentives are available to design professionals as described in the Program materials and applications. A different and separate agreement must be executed by participating design professionals to be eligible for this type of incentive. The design professional does not need to be based in New Jersey.

Equipment procured by Participating Customers through another program offered by New Jersey's Clean Energy Program or the New Jersey Utilities, as applicable, is not eligible for incentives through this program. Customers who have not contributed to the Societal Benefits Charge of the applicable New Jersey Utility are not eligible for incentives offered through this program.

Incentive Amount – Program Incentives will equal either: a) the approved Program Incentive amount, or b) the actual equipment cost of the Energy-Efficient Measure, whichever is less, as determined by the Market Manager. Products offered at no direct cost to the customer are ineligible. Incomplete application submissions, applications requiring inspections and unanticipated high volume of activities may cause processing delays. Program Incentives are limited to \$500,000 per utility account in a calendar year. Contact the Market Manager regarding any questions.

Tax Liability – The Market Manager will not be responsible for any tax liability that may be imposed on any Participating Customer as a result of the payment of Program Incentives. All Participating Customers must supply their Federal Tax Identification number or social security number to the Market Manager on the application form in order to receive a Program Incentive. In addition, Participating Customers must also provide a Tax Clearance Form (Business Assistance or Incentive Clearance Certificate) that is dated within 90 days of equipment installation.

Endorsement – The Market Manager and Administrator do not endorse, support or recommend any particular manufacturer, product or system design in promoting this Program.

Warranties – THE MARKET MANAGER AND ADMINISTRATOR DO NOT WARRANT THE PERFORMANCE OF INSTALLED EQUIPMENT, AND/OR SERVICES RENDERED AS PART OF THIS PROGRAM, EITHER EXPRESSLY OR IMPLICITLY. NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESSED, OR IMPLIED, INCLUDING, WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING EQUIPMENT OR SERVICES PROVIDED BY A MANUFACTURER OR VENDOR. CONTACT YOUR VENDOR/SERVICES PROVIDER FOR DETAILS REGARDING PERFORMANCE AND WARRANTIES.

Limitation of Liability – By virtue of participating in this Program, Participating Customers agree to waive any and all claims or damages against the Market Manager or the Administrator, except the receipt of the Program Incentive. Participating Customers agree that the Market Manager's and Administrator's liability, in connection with this Program, is limited to paying the Program Incentive specified. Under no circumstances shall the Market Manager, its representatives, or subcontractors, or the Administrator, be liable for any lost profits, special, punitive, consequential or incidental damages or for any other damages or claims connected with or resulting from participation in this Program. Further, any liability attributed to the Market Manager under this Program shall be individual, and not joint and/or several.

Assignment – The Participating Customer may assign Program Incentive payments to a specified vendor.

Participating Customer's Certification – Participating Customer certifies that he/she purchased and installed the equipment listed in their application at their defined New Jersey location. Participating Customer agrees that all information is true and that he/she has conformed to all of the Program and equipment requirements listed in the application.

Termination – The New Jersey Board of Public Utilities reserves the right to extend, modify (this includes modification of Program Incentive levels) or terminate this Program without prior or further notice.

Acknowledgement – I have read, understood and am in compliance with all rules and regulations concerning this incentive program. I certify that all information provided is correct to the best of my knowledge, and I give the Market Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the NJ SmartStart Buildings Program. Additionally, I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for incentives under the guidelines of New Jersey's Clean Energy Program.



Specific Program Requirements* (These requirements are in addition to the Program Terms and Conditions.)

1. Please refer to the Program Guide for additional applicable technical requirements.
2. Include the manufacturer's specification sheet with the application package and mail or fax directly to the Commercial/Industrial Market Manager.
3. Incentives for T-5 and T-8 lamps with electronic ballasts are available only for fixtures with a Total Harmonic Distortion of $\leq 20\%$.
4. All eligible lighting devices must be UL listed.
5. Requirements for CFL fixtures (must meet all requirements):
 - Fixtures must be new and Energy Star qualified
 - Fixtures must have replaceable electronic ballasts
 - Total Harmonic Distortion (THD) must not exceed 33%
 - Power factor of the ballast must be no less than 90%
 - The manufacturer must warrant all fixtures for a minimum of 3 years. Warranty does not pertain to lamps or photocells not physically part of the fixture.
 - The installer must warrant fixture installation – minimum of 1 yr.
- 5.1 Screw-in PAR 38 or 30 Compact Fluorescent Lamps (CFL) with Aluminum Reflectors replacing existing incandescent fixtures.
 - The lamp must be warranted by the manufacturer for 8,000 hours
 - Total Harmonic Distortion must not exceed 33%
 - Power factor of the ballast must be $\geq 90\%$
6. Pulse Start Metal Halide (including pole-mounted parking lot lighting) must have a 12% minimum wattage reduction.
7. T-5 or T-8 Fixtures replacing incandescent or T-12 fluorescent fixtures greater than 250 watt or High Intensity Discharge shall comply as follows:
 - 7.1 T-5 fixtures replacing T-12 fluorescent or incandescent fixtures 250 watts or greater, or HID fixtures shall have a ballast factor greater than or equal to 1.0; have reflectivity greater than or equal to 91%; have a minimum 2 lamps; and be designated as F54T5 HO.
 - 7.2 T-8 fixtures replacing T-12 fluorescent or incandescent fixtures 250 watts or greater, or HID fixtures shall have a ballast factor greater than or equal to 1.14; have reflectivity greater than or equal to 91%; have a minimum of 4 lamps; and be designated as F32T8, minimum 32 watts.
 - 7.3 Incentives for delamped T-8 lamps with new reflectors are available only for fixtures with a total Harmonic Distortion of $\leq 20\%$. Electronic ballast replacement required for all eligible delamped fixtures. Eligible delamping can include reduction in linear lamp feet from existing conditions. For example, 1-8' linear fluorescent lamp can be considered as 2-4' linear lamps. U-bend lamps 4' in total length can be considered as 2-F17/T8 lamps.
 - 7.4 Electronic ballast replacement is necessary for all eligible delamped fixtures.
 - 7.5 Reduced wattage T8 (28W/25W 4') (1-4 lamps) retrofit requires lamp and ballast replacement.
8. LED Refrigerated/Freezer Case Lighting must meet NEEP Design Lights Consortium Standards or be on an ENERGY STAR or a SSL Qualified Product list. For new door installations on existing open cases, indicate the number of LED fixtures to be installed. Also indicate "New Door" in the Fixture Type column on the Prescriptive Lighting Worksheet (ie. New Door 5' LED).

ACKNOWLEDGEMENT

CUSTOMER'S SIGNATURE	By signing, I certify that I have read, understand and agree to the Specific Program Requirements/Terms and Conditions listed on this application form. I will also submit for approval a properly completed application package, which includes this signed application, worksheet (if applicable), manufacturer's specification sheets and complete utility bill (name and address on utility bill must match name and address on application).
-----------------------------	---

Prescriptive Lighting Measures and Incentives*			
Type of Fixture		Incentive	
Recessed and Surface-Mounted Compact Fluorescents (New Fixtures Replacing Incandescent Fixtures Only): Only available for hard-wired, electronically ballasted new fixtures with rare earth phosphor lamps and 4-pin based tubes (including: twin tube, quad tube, triple tube, 2D or circline lamps), THD$\leq 33\%$ and BF≥ 0.9		\$25 per 1-lamp fixture \$30 per 2-lamp or more fixture	
Screw-in PAR 38 or PAR 30 (CFL) as per 5.1 above		\$7 per lamp replaced	
High-Efficiency Fluorescent Fixtures: For retrofit of T-12 fixtures to T-5 or T-8 with electronic ballasts		\$15 per fixture (1-4 lamps retrofits)	
For replacement of fixtures with new T-5 or T-8 fixtures			
Type of Old Fixture	Wattage of Old Fixture	Type of New Fixture	Incentive Per Fixture Removed
HID, T-12, Incandescent	≥ 1000 Watts	T-5, T-8	\$284
HID, T-12, Incandescent	400-999 Watt	T-5, T-8	\$100
HID, T-12, Incandescent	250-399 Watt	T-5, T-8	\$50
HID only	175-249 Watt	T-5, T-8	\$43
HID only	100-174 Watt	T-5, T-8	\$30
HID only	75-99 Watt	T-5, T-8	\$16
T-12 only	≤ 250 Watt	T-5, T-8 (1 & 2 lamp)	\$25
T-12 only	≤ 250 Watt	T-5, T-8 (3 & 4 lamp)	\$50
For retrofit of T-8 fixtures by permanent delamping & new reflectors are available only for fixtures with a total Harmonic Distortion of $\leq 20\%$. Electronic ballast replacement required for all eligible delamped fixtures.		\$20 per fixture	
New Construction & Complete Renovation		Performance based only	
LED Exit Signs (new fixtures only): For existing facilities with connected load < 75 kW		\$20 per fixture	
For existing facilities with connected load ≥ 75 kW		\$10 per fixture	
Pulse Start Metal Halide (for fixtures ≥ 150 watts)		\$25 per fixture (includes parking lot lighting)	
Parking lot low bay - LED		\$43 per fixture	
T-12 to T-8 fixtures by permanent delamping & new reflectors. Electronic ballast replacement is necessary for all eligible delamped fixtures.		\$30 per fixture	
Retrofit of existing 32 watt T-8 system to Reduced Wattage (28W/25W 4')		\$10 per fixture (1-4 lamps)	
LED Refrigerated/Freezer Case Lighting: Incentive for replacement of fluorescent lighting systems in medium or low temperature display cases		\$42 per 5' LED Fixture \$65 per 6' LED Fixture	
Induction Lighting Fixtures Retrofit of HID		\$50 per HID ($\geq 100W$) fixture retrofitted with induction lamp, power coupler and generator. Replacement unit must use 50% less wattage per fixture than existing HID system	
Replacement of HID		\$70 per HID ($\geq 100W$) fixture with a new induction fixture	

Mail or fax your application package DIRECTLY to the Commercial/Industrial Market Manager.

New Jersey's Clean Energy Program
 c/o TRC Energy Services
 900 Route 9 North, Suite 104 • Woodbridge, NJ 07095
 Phone: 866-657-6278 • Fax: 732-855-0422

Visit our web site: NJCleanEnergy.com/ssb

New Jersey SmartStart Buildings® is a registered trademark. Use of the mark without the permission of the New Jersey Board of Public Utilities, Office of Clean Energy is prohibited.

*Incentives/Requirements subject to change.



Program Terms and Conditions

Definitions:

Design Incentives – Incentives that may be offered to design professionals by the Program.

Design Services – Services that may be offered to design professionals under the Program.

Energy-Efficient Measures – Any device eligible to receive a Program Incentive payment through the NJ Clean Energy Commercial and Industrial Program (New Jersey SmartStart Buildings).

New Jersey Utilities – The regulated electric and/or gas utilities in the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.

Administrator – New Jersey Board of Public Utilities, Office of Clean Energy

Participating Customers – Those non-residential electric and/or gas service customers of the New Jersey Utilities who participate in this Program.

Product Installation or Equipment Installation – Installation of the Energy-Efficient Measures.

Market Manager – TRC Energy Services.

Program – The Commercial and Industrial Energy-Efficient Construction Program (New Jersey SmartStart Buildings) offered herein by the New Jersey Board of Public Utilities, Office of Clean Energy pursuant to state regulatory approval under the New Jersey Electric Discount and Energy Competition Act, NJSA 48:3-49, et seq.

Program Incentives – Refers to the amount or level of incentive that the Program provides to Participating Customers pursuant to the Program offered herein (see description under “Incentive Amount” heading).

Program Offer – Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities identified above. Program Incentives for new construction are available only for projects in areas designated for growth in the State Plan. Public school (K-12) new construction projects are exempted from this restriction and are eligible for new Program incentives throughout the State. Customers, or their trade allies, can determine if a location is in a designated growth area by referring to the Smart Growth Locator available from the HMFA website or contact the Market Manager if you are uncertain about project eligibility.

Application and Eligibility Process – The Program pays incentives after the installation of qualified energy efficient measures that were pre-approved (for exceptions to this condition, please refer to “Exceptions for Approval”). In order to be eligible for Program Incentives, a Customer, or an agent (contractor/vendor) authorized by a Customer, must submit a properly completed application package. The package must include an application signed by the customer; a complete (current) utility bill; and technology worksheet and manufacturer’s cut sheets (where appropriate). This information must be submitted to the Market Manager before equipment is installed. Applications for measures that are self installed by customers must be submitted by the customer and not the sales vendor of the measure, however, the customer may elect to assign payment of the incentive to the sales vendor. This application package must be received by the Market Manager on or before December 31, 2010 in order to be eligible for 2010 incentives. The Market Manager will review the application package to determine if the project is eligible for a Program Incentive. If eligible, the Customer will receive an approval letter with the estimated authorized incentive amount and the date by which the equipment must be installed in order for the approval to remain in effect. Upon receipt of an approval letter, the Customer may then proceed to install the equipment listed on the approved application. Equipment installed prior to the date of the Market Manager’s approval letter is not eligible for an incentive. The Market Manager reserves the right to conduct a pre-inspection of the facility prior to the installation of equipment. This will be done prior to the issuance of the approval letter. All equipment must be purchased within 12 months of date of application. **Any Customer and/or agent who purchases equipment prior to the receipt of an incentive approval letter does so at his/her own risk.**

Exceptions for Approval – The Application and Eligibility Process pertains to all projects except for those involving either Unitary HVAC or Motors having an incentive amount less than \$5,000. These measures, at this incentive level, may be installed without prior approval. In addition, but at the sole discretion of the Market Manager, emergency replacement of equipment may not require a prior approval determination and letter. **In such cases, please notify the Market Manager of such emergencies as early as possible, that an application will soon be sent in that was not pre-approved.**

Post Installation Approval – After installation is completed, the Customer, or an agent authorized by the Customer, must finalize and submit an invoice for the purchase of the equipment (material cost must be broken out from labor costs), and any other required documentation as specified on the equipment application or in the Market Manager’s initial approval letter.

Please refer to the Program Guide on the NJCleanEnergy.com/ssb website for the complete Application and Eligibility Process.

The Market Manager reserves the right to verify sales transactions and to have reasonable access to Participating Customer's facility to inspect both pre-existing product or equipment (if applicable) and the Energy-Efficient Measures installed under this Program, either prior to issuing incentives or at a later time.

Energy-Efficient Measures must be installed in buildings located within a New Jersey Utilities' service territory and designated on the Participating Customer's incentive application. Program Incentives are available for qualified Energy-Efficient Measures as listed and described in the Program materials and incentive applications. The Participating Customer must ultimately own the equipment, either through an up-front purchase or at the end of a short-term lease. Design Incentives are available to design professionals as described in the Program materials and applications. A different and separate agreement must be executed by participating design professionals to be eligible for this type of incentive. The design professional does not need to be based in New Jersey.

Equipment procured by Participating Customers through another program offered by New Jersey's Clean Energy Program or the New Jersey Utilities, as applicable, is not eligible for incentives through this program. Customers who have not contributed to the Societal Benefits Charge of the applicable New Jersey Utility are not eligible for incentives offered through this program.

Incentive Amount – Program Incentives will equal either: a) the approved Program Incentive amount, or b) the actual equipment cost of the Energy-Efficient Measure, whichever is less, as determined by the Market Manager. Products offered at no direct cost to the customer are ineligible. Incomplete application submissions, applications requiring inspections and unanticipated high volume of activities may cause processing delays. Program Incentives are limited to \$500,000 per utility account in a calendar year. Contact the Market Manager regarding any questions.

Tax Liability – The Market Manager will not be responsible for any tax liability that may be imposed on any Participating Customer as a result of the payment of Program Incentives. All Participating Customers must supply their Federal Tax Identification number or social security number to the Market Manager on the application form in order to receive a Program Incentive. In addition, Participating Customers must also provide a Tax Clearance Form (Business Assistance or Incentive Clearance Certificate) that is dated within 90 days of equipment installation.

Endorsement – The Market Manager and Administrator do not endorse, support or recommend any particular manufacturer, product or system design in promoting this Program.

Warranties – THE MARKET MANAGER AND ADMINISTRATOR DO NOT WARRANT THE PERFORMANCE OF INSTALLED EQUIPMENT, AND/OR SERVICES RENDERED AS PART OF THIS PROGRAM, EITHER EXPRESSLY OR IMPLICITLY. NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESSED, OR IMPLIED, INCLUDING, WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING EQUIPMENT OR SERVICES PROVIDED BY A MANUFACTURER OR VENDOR. CONTACT YOUR VENDOR/SERVICES PROVIDER FOR DETAILS REGARDING PERFORMANCE AND WARRANTIES.

Limitation of Liability – By virtue of participating in this Program, Participating Customers agree to waive any and all claims or damages against the Market Manager or the Administrator, except the receipt of the Program Incentive. Participating Customers agree that the Market Manager's and Administrator's liability, in connection with this Program, is limited to paying the Program Incentive specified. Under no circumstances shall the Market Manager, its representatives, or subcontractors, or the Administrator, be liable for any lost profits, special, punitive, consequential or incidental damages or for any other damages or claims connected with or resulting from participation in this Program. Further, any liability attributed to the Market Manager under this Program shall be individual, and not joint and/or several.

Assignment – The Participating Customer may assign Program Incentive payments to a specified vendor.

Participating Customer's Certification – Participating Customer certifies that he/she purchased and installed the equipment listed in their application at their defined New Jersey location. Participating Customer agrees that all information is true and that he/she has conformed to all of the Program and equipment requirements listed in the application.

Termination – The New Jersey Board of Public Utilities reserves the right to extend, modify (this includes modification of Program Incentive levels) or terminate this Program without prior or further notice.

Acknowledgement – I have read, understood and am in compliance with all rules and regulations concerning this incentive program. I certify that all information provided is correct to the best of my knowledge, and I give the Market Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the NJ SmartStart Buildings Program. Additionally, I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for incentives under the guidelines of New Jersey's Clean Energy Program.



2010 Lighting Controls Application

Customer Information

Company		Electric Utility Serving Applicant		Electric Account No.		Installation Date	
Facility Address				City		State Zip	
Type of Project ☐ New Construction ☐ Renovation ☐ Equipment Replacement						Size of Building	
Company Mailing Address				City		State Zip	
Contact Person (Name/Title)				Telephone No. ()		Fax No. ()	
Incorporated? ☐ Yes ☐ No ☐ Exempt				Federal Tax ID# or SSN		Email Address	
Incentive Payment to ☐ Customer ☐ Contractor ☐ Other				Please assign payment to contractor/vendor/other indicated below Customer Signature			

Payee Information (must submit W-9 form with application)

Company						Contact Name		Incorporated? Yes No		Email Address	
Street Address						City		State		Zip	
								Telephone No. ()		Fax No. ()	

Contractor/Vendor Information (if different from Payee)

Company						Contact Name		Incorporated? ☐ Yes ☐ No		Email Address	
Street Address						City		State		Zip	
								Telephone No. ()		Fax No. ()	

Building Type (circle one)

Education-Primary School; Education-Community College; Education-University; Grocery; Medical-Hospital; Medical-Clinic; Lodging Hotel(Guest Rooms); Lodging Motel; Manufacturing-Light Industrial; Office-Large; Office-Small; Restaurant-Sit Down; Restaurant-Fast Food; Retail-3 Story Large; Retail- Single Story Large; Retail-Small; Storage Conditioned; Storage Unconditioned; Warehouse; Other

Lighting Control Incentive

\$_____ Total Incentive (per attached worksheet calculations)

Note: Lighting Controls Incentive Worksheet must accompany this application.

Specific Program Requirements* (These requirements are in addition to the Program Terms and Conditions.)

1. Please refer to the Program Guide for additional applicable technical requirements, including special requirements for lighting controls.
2. Include the manufacturer's specification sheet with the application package and mail or fax directly to the Commercial/Industrial Market Manager.
3. All lighting controls eligible for incentives must be UL listed.
4. Lighting control incentives are only available for control of eligible energy efficient lighting fixtures.
5. If more than one eligible lighting control device is associated with the same eligible fixture, the incentive paid will be for the lighting control device that yields the largest incentive only.
6. Occupancy Sensor Controls (existing facilities only):
 - There is no incentive available for occupancy sensors installed in a space where they are prohibited by state or local building or safety code. Additionally, no incentive is eligible for occupancy sensors in the following specific spaces in all cases: stairways, restrooms (remote mounted only allowed), elevators, corridors/hallways, lobbies, and closets/storage areas.
 - Incentives will only be paid for eligible occupancy sensors (OSW & OSR) controlling at least 2 eligible lighting fixtures and, for OSR installations, a minimum total connected load of 180 watts.
 - Incentives will only be paid for eligible OSRH occupancy sensors controlling eligible fixtures when the controlled wattage is greater than 180 watts.
 - Occupancy sensors with manual override to the "ON" position are ineligible for incentive.
7. High-Low Controls (OHLF and OHLH):
 - Incentives will not be paid for high-low controls on eligible fluorescent fixtures where daylight dimming controls can be effectively employed.
 - Incentives will not be paid for spaces smaller than 250 square feet.
 - Incentives available only when "low level" is no more than 60% of "high level."
 - Incentives are not available for the following spaces: stairways, elevators, corridors/hallways, or lobbies.
 - OHLF will control fixtures that have a ballast factor less than 1.0 for T-5s and 1.14 for T-8s.
 - OHLH will control fixtures that have a ballast factor greater than or equal to 1.0 for T-5s and 1.14 for T-8s.
8. Daylight Dimming Controls for eligible fixtures:
 - Incentives will only be paid for eligible daylight dimming controls operating at least 4 eligible ballasts with a minimum total connected load of 240 watts.
 - Dimming shall be continuous or stepped at 4 or more levels.
 - Incentives will be paid only for eligible daylight dimming control systems designed in accordance with IESNA practice as delineated in "RP-5-99, IESNA Recommended Practice of Daylighting."
 - DLD will control fixtures that have a ballast factor less than 1.0 for T-5s and 1.14 for T-8s.
 - DDH will control fixtures that have a ballast factor greater than or equal to 1.0 for T-5s and 1.14 for T-8s.

Application Checklist (Before submitting your application, please make sure you have signed in the space below and completed the following items.)

- ☐ Payee Information is filled out and a W-9 form of the payee is included
- ☐ Manufacturer's specification sheets for proposed technology are included
- ☐ A copy (all pages) of a recent month's utility bill is included

ACKNOWLEDGEMENT**CUSTOMER'S SIGNATURE**

By signing, I certify that I have read, understand and agree to the Specific Program Requirements/Terms and Conditions listed on this application form, I will also submit for approval a properly completed application package, which includes this signed application, worksheet (if applicable), manufacturer's specification sheets and complete utility bill (name and address on utility bill must match name and address on application).

Lighting Control Prescriptive Incentives*

Control Device Type	Incentive per Unit
OSW – Occupancy Sensor Wall Mounted (Existing facilities only)	\$20 per control
OSR – Occupancy Sensor Remote Mounted (Existing facilities only)	\$35 per control
DLD – Fluorescent Daylight Dimming	\$25 per fixture controlled
DLD – Fluorescent Daylight Dimming (Office Applications)	\$50 per fixture controlled
OHLF – Occupancy Controlled High-Low with Step Ballast	\$25 per fixture controlled
OSRH – Occupancy Sensor Remote Mounted	\$35 per control
OHLH – Occupancy Controlled High-Low with Step Ballast	\$75 per fixture controlled
DDH – Daylight Dimming	\$75 per fixture controlled

Mail or fax your application package DIRECTLY to the Commercial/Industrial Market Manager.

New Jersey's Clean Energy Program
c/o TRC Energy Services
900 Route 9 North, Suite 104 • Woodbridge, NJ 07095
Phone: 866-657-6278 • Fax: 732-855-0422

Visit our web site: www.NJCleanEnergy.com

Program Terms and Conditions

Definitions:

Design Incentives – Incentives that may be offered to design professionals by the Program.

Design Services – Services that may be offered to design professionals under the Program.

Energy-Efficient Measures – Any device eligible to receive a Program Incentive payment through the NJ Clean Energy Commercial and Industrial Program (New Jersey SmartStart Buildings).

New Jersey Utilities – The regulated electric and/or gas utilities in the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.

Administrator – New Jersey Board of Public Utilities, Office of Clean Energy

Participating Customers – Those non-residential electric and/or gas service customers of the New Jersey Utilities who participate in this Program.

Product Installation or Equipment Installation – Installation of the Energy-Efficient Measures.

Market Manager – TRC Energy Services.

Program – The Commercial and Industrial Energy-Efficient Construction Program (New Jersey SmartStart Buildings) offered herein by the New Jersey Board of Public Utilities, Office of Clean Energy pursuant to state regulatory approval under the New Jersey Electric Discount and Energy Competition Act, NJSA 48:3-49, et seq.

Program Incentives – Refers to the amount or level of incentive that the Program provides to Participating Customers pursuant to the Program offered herein (see description under “Incentive Amount” heading).

Program Offer – Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities identified above. Program Incentives for new construction are available only for projects in areas designated for growth in the State Plan. Public school (K-12) new construction projects are exempted from this restriction and are eligible for new Program incentives throughout the State. Customers, or their trade allies, can determine if a location is in a designated growth area by referring to the Smart Growth Locator available from the HMFA website or contact the Market Manager if you are uncertain about project eligibility.

Application and Eligibility Process – The Program pays incentives after the installation of qualified energy efficient measures that were pre-approved (for exceptions to this condition, please refer to “Exceptions for Approval”). In order to be eligible for Program Incentives, a Customer, or an agent (contractor/vendor) authorized by a Customer, must submit a properly completed application package. The package must include an application signed by the customer; a complete (current) utility bill; and technology worksheet and manufacturer’s cut sheets (where appropriate). This information must be submitted to the Market Manager before equipment is installed. Applications for measures that are self installed by customers must be submitted by the customer and not the sales vendor of the measure, however, the customer may elect to assign payment of the incentive to the sales vendor. This application package must be received by the Market Manager on or before December 31, 2010 in order to be eligible for 2010 incentives. The Market Manager will review the application package to determine if the project is eligible for a Program Incentive. If eligible, the Customer will receive an approval letter with the estimated authorized incentive amount and the date by which the equipment must be installed in order for the approval to remain in effect. Upon receipt of an approval letter, the Customer may then proceed to install the equipment listed on the approved application. Equipment installed prior to the date of the Market Manager’s approval letter is not eligible for an incentive. The Market Manager reserves the right to conduct a pre-inspection of the facility prior to the installation of equipment. This will be done prior to the issuance of the approval letter. All equipment must be purchased within 12 months of date of application. **Any Customer and/or agent who purchases equipment prior to the receipt of an incentive approval letter does so at his/her own risk.**

Exceptions for Approval – The Application and Eligibility Process pertains to all projects except for those involving either Unitary HVAC or Motors having an incentive amount less than \$5,000. These measures, at this incentive level, may be installed without prior approval. In addition, but at the sole discretion of the Market Manager, emergency replacement of equipment may not require a prior approval determination and letter. **In such cases, please notify the Market Manager of such emergencies as early as possible, that an application will soon be sent in that was not pre-approved.**

Post Installation Approval – After installation is completed, the Customer, or an agent authorized by the Customer, must finalize and submit an invoice for the purchase of the equipment (material cost must be broken out from labor costs), and any other required documentation as specified on the equipment application or in the Market Manager’s initial approval letter.

Please refer to the Program Guide on the NJCleanEnergy.com/ssb website for the complete Application and Eligibility Process.

The Market Manager reserves the right to verify sales transactions and to have reasonable access to Participating Customer's facility to inspect both pre-existing product or equipment (if applicable) and the Energy-Efficient Measures installed under this Program, either prior to issuing incentives or at a later time.

Energy-Efficient Measures must be installed in buildings located within a New Jersey Utilities' service territory and designated on the Participating Customer's incentive application. Program Incentives are available for qualified Energy-Efficient Measures as listed and described in the Program materials and incentive applications. The Participating Customer must ultimately own the equipment, either through an up-front purchase or at the end of a short-term lease. Design Incentives are available to design professionals as described in the Program materials and applications. A different and separate agreement must be executed by participating design professionals to be eligible for this type of incentive. The design professional does not need to be based in New Jersey.

Equipment procured by Participating Customers through another program offered by New Jersey's Clean Energy Program or the New Jersey Utilities, as applicable, is not eligible for incentives through this program. Customers who have not contributed to the Societal Benefits Charge of the applicable New Jersey Utility are not eligible for incentives offered through this program.

Incentive Amount – Program Incentives will equal either: a) the approved Program Incentive amount, or b) the actual equipment cost of the Energy-Efficient Measure, whichever is less, as determined by the Market Manager. Products offered at no direct cost to the customer are ineligible. Incomplete application submissions, applications requiring inspections and unanticipated high volume of activities may cause processing delays. Program Incentives are limited to \$500,000 per utility account in a calendar year. Contact the Market Manager regarding any questions.

Tax Liability – The Market Manager will not be responsible for any tax liability that may be imposed on any Participating Customer as a result of the payment of Program Incentives. All Participating Customers must supply their Federal Tax Identification number or social security number to the Market Manager on the application form in order to receive a Program Incentive. In addition, Participating Customers must also provide a Tax Clearance Form (Business Assistance or Incentive Clearance Certificate) that is dated within 90 days of equipment installation.

Endorsement – The Market Manager and Administrator do not endorse, support or recommend any particular manufacturer, product or system design in promoting this Program.

Warranties – THE MARKET MANAGER AND ADMINISTRATOR DO NOT WARRANT THE PERFORMANCE OF INSTALLED EQUIPMENT, AND/OR SERVICES RENDERED AS PART OF THIS PROGRAM, EITHER EXPRESSLY OR IMPLICITLY. NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESSED, OR IMPLIED, INCLUDING, WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING EQUIPMENT OR SERVICES PROVIDED BY A MANUFACTURER OR VENDOR. CONTACT YOUR VENDOR/SERVICES PROVIDER FOR DETAILS REGARDING PERFORMANCE AND WARRANTIES.

Limitation of Liability – By virtue of participating in this Program, Participating Customers agree to waive any and all claims or damages against the Market Manager or the Administrator, except the receipt of the Program Incentive. Participating Customers agree that the Market Manager's and Administrator's liability, in connection with this Program, is limited to paying the Program Incentive specified. Under no circumstances shall the Market Manager, its representatives, or subcontractors, or the Administrator, be liable for any lost profits, special, punitive, consequential or incidental damages or for any other damages or claims connected with or resulting from participation in this Program. Further, any liability attributed to the Market Manager under this Program shall be individual, and not joint and/or several.

Assignment – The Participating Customer may assign Program Incentive payments to a specified vendor.

Participating Customer's Certification – Participating Customer certifies that he/she purchased and installed the equipment listed in their application at their defined New Jersey location. Participating Customer agrees that all information is true and that he/she has conformed to all of the Program and equipment requirements listed in the application.

Termination – The New Jersey Board of Public Utilities reserves the right to extend, modify (this includes modification of Program Incentive levels) or terminate this Program without prior or further notice.

Acknowledgement – I have read, understood and am in compliance with all rules and regulations concerning this incentive program. I certify that all information provided is correct to the best of my knowledge, and I give the Market Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the NJ SmartStart Buildings Program. Additionally, I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for incentives under the guidelines of New Jersey's Clean Energy Program.



Specific Program Requirements* (These requirements are in addition to the Program Terms and Conditions.)

1. Please refer to the Program Guide for additional applicable technical requirements, including special requirements for lighting controls.
2. Include the manufacturer's specification sheet with the application package and mail or fax directly to the Commercial/Industrial Market Manager.
3. All lighting controls eligible for incentives must be UL listed.
4. Lighting control incentives are only available for control of eligible energy efficient lighting fixtures.
5. If more than one eligible lighting control device is associated with the same eligible fixture, the incentive paid will be for the lighting control device that yields the largest incentive only.
6. Occupancy Sensor Controls (existing facilities only):
 - There is no incentive available for occupancy sensors installed in a space where they are prohibited by state or local building or safety code. Additionally, no incentive is eligible for occupancy sensors in the following specific spaces in all cases: stairways, restrooms (remote mounted only allowed), elevators, corridors/hallways, lobbies, and closets/storage areas.
 - Incentives will only be paid for eligible occupancy sensors (OSW & OSR) controlling at least 2 eligible lighting fixtures and, for OSR installations, a minimum total connected load of 180 watts.
 - Incentives will only be paid for eligible OSRH occupancy sensors controlling eligible fixtures when the controlled wattage is greater than 180 watts.
 - Occupancy sensors with manual override to the "ON" position are ineligible for incentive.
7. High-Low Controls (OHLF and OHLH):
 - Incentives will not be paid for high-low controls on eligible fluorescent fixtures where daylight dimming controls can be effectively employed.
 - Incentives will not be paid for spaces smaller than 250 square feet.
 - Incentives available only when "low level" is no more than 60% of "high level."
 - Incentives are not available for the following spaces: stairways, elevators, corridors/hallways, or lobbies.
 - OHLF will control fixtures that have a ballast factor less than 1.0 for T-5s and 1.14 for T-8s.
 - OHLH will control fixtures that have a ballast factor greater than or equal to 1.0 for T-5s and 1.14 for T-8s.
8. Daylight Dimming Controls for Eligible Fixtures:
 - Incentives will only be paid for eligible daylight dimming controls operating at least 4 eligible ballasts with a minimum total connected load of 240 watts.
 - Dimming shall be continuous or stepped at 4 or more levels.
 - Incentives will be paid only for eligible daylight dimming control systems designed in accordance with IESNA practice as delineated in "RP-5-99, IESNA Recommended Practice of Daylighting."
 - DLD will control fixtures that have a ballast factor less than 1.0 for T-5s and 1.14 for T-8s.
 - DDH will control fixtures that have a ballast factor greater than or equal to 1.0 for T-5s and 1.14 for T-8s.

Lighting Control Prescriptive Incentives*

Control Device Type	Incentive per Unit
OSW – Occupancy Sensor Wall Mounted (Existing facilities only)	\$20 per control
OSR – Occupancy Sensor Remote Mounted (Existing facilities only)	\$35 per control
DLD – Fluorescent Daylight Dimming	\$25 per fixture controlled
DLD – Fluorescent Daylight Dimming (Office Applications)	\$50 per fixture controlled
OHLF – Occupancy Controlled High-Low with Step Ballast	\$25 per fixture controlled
OSRH – Occupancy Sensor Remote Mounted	\$35 per control
OHLH – Occupancy Controlled High-Low with Step Ballast	\$75 per fixture controlled
DDH – Daylight Dimming	\$75 per fixture controlled

Mail or fax your application package DIRECTLY to the Commercial/Industrial Market Manager.

New Jersey's Clean Energy Program
 c/o TRC Energy Services
 900 Route 9 North, Suite 104 • Woodbridge, NJ 07095
 Phone: 866-657-6278 • Fax: 732-855-0422

Visit our web site: www.NJCleanEnergy.com



Program Terms and Conditions

Definitions:

Design Incentives – Incentives that may be offered to design professionals by the Program.

Design Services – Services that may be offered to design professionals under the Program.

Energy-Efficient Measures – Any device eligible to receive a Program Incentive payment through the NJ Clean Energy Commercial and Industrial Program (New Jersey SmartStart Buildings).

New Jersey Utilities – The regulated electric and/or gas utilities in the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.

Administrator – New Jersey Board of Public Utilities, Office of Clean Energy

Participating Customers – Those non-residential electric and/or gas service customers of the New Jersey Utilities who participate in this Program.

Product Installation or Equipment Installation – Installation of the Energy-Efficient Measures.

Market Manager – TRC Energy Services.

Program – The Commercial and Industrial Energy-Efficient Construction Program (New Jersey SmartStart Buildings) offered herein by the New Jersey Board of Public Utilities, Office of Clean Energy pursuant to state regulatory approval under the New Jersey Electric Discount and Energy Competition Act, NJSA 48:3-49, et seq.

Program Incentives – Refers to the amount or level of incentive that the Program provides to Participating Customers pursuant to the Program offered herein (see description under “Incentive Amount” heading).

Program Offer – Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities identified above. Program Incentives for new construction are available only for projects in areas designated for growth in the State Plan. Public school (K-12) new construction projects are exempted from this restriction and are eligible for new Program incentives throughout the State. Customers, or their trade allies, can determine if a location is in a designated growth area by referring to the Smart Growth Locator available from the HMFA website or contact the Market Manager if you are uncertain about project eligibility.

Application and Eligibility Process – The Program pays incentives after the installation of qualified energy efficient measures that were pre-approved (for exceptions to this condition, please refer to “Exceptions for Approval”). In order to be eligible for Program Incentives, a Customer, or an agent (contractor/vendor) authorized by a Customer, must submit a properly completed application package. The package must include an application signed by the customer; a complete (current) utility bill; and technology worksheet and manufacturer’s cut sheets (where appropriate). This information must be submitted to the Market Manager before equipment is installed. Applications for measures that are self installed by customers must be submitted by the customer and not the sales vendor of the measure, however, the customer may elect to assign payment of the incentive to the sales vendor. This application package must be received by the Market Manager on or before December 31, 2010 in order to be eligible for 2010 incentives. The Market Manager will review the application package to determine if the project is eligible for a Program Incentive. If eligible, the Customer will receive an approval letter with the estimated authorized incentive amount and the date by which the equipment must be installed in order for the approval to remain in effect. Upon receipt of an approval letter, the Customer may then proceed to install the equipment listed on the approved application. Equipment installed prior to the date of the Market Manager’s approval letter is not eligible for an incentive. The Market Manager reserves the right to conduct a pre-inspection of the facility prior to the installation of equipment. This will be done prior to the issuance of the approval letter. All equipment must be purchased within 12 months of date of application. **Any Customer and/or agent who purchases equipment prior to the receipt of an incentive approval letter does so at his/her own risk.**

Exceptions for Approval – The Application and Eligibility Process pertains to all projects except for those involving either Unitary HVAC or Motors having an incentive amount less than \$5,000. These measures, at this incentive level, may be installed without prior approval. In addition, but at the sole discretion of the Market Manager, emergency replacement of equipment may not require a prior approval determination and letter. **In such cases, please notify the Market Manager of such emergencies as early as possible, that an application will soon be sent in that was not pre-approved.**

Post Installation Approval – After installation is completed, the Customer, or an agent authorized by the Customer, must finalize and submit an invoice for the purchase of the equipment (material cost must be broken out from labor costs), and any other required documentation as specified on the equipment application or in the Market Manager’s initial approval letter.

Please refer to the Program Guide on the NJCleanEnergy.com/ssb website for the complete Application and Eligibility Process.

The Market Manager reserves the right to verify sales transactions and to have reasonable access to Participating Customer's facility to inspect both pre-existing product or equipment (if applicable) and the Energy-Efficient Measures installed under this Program, either prior to issuing incentives or at a later time.

Energy-Efficient Measures must be installed in buildings located within a New Jersey Utilities' service territory and designated on the Participating Customer's incentive application. Program Incentives are available for qualified Energy-Efficient Measures as listed and described in the Program materials and incentive applications. The Participating Customer must ultimately own the equipment, either through an up-front purchase or at the end of a short-term lease. Design Incentives are available to design professionals as described in the Program materials and applications. A different and separate agreement must be executed by participating design professionals to be eligible for this type of incentive. The design professional does not need to be based in New Jersey.

Equipment procured by Participating Customers through another program offered by New Jersey's Clean Energy Program or the New Jersey Utilities, as applicable, is not eligible for incentives through this program. Customers who have not contributed to the Societal Benefits Charge of the applicable New Jersey Utility are not eligible for incentives offered through this program.

Incentive Amount – Program Incentives will equal either: a) the approved Program Incentive amount, or b) the actual equipment cost of the Energy-Efficient Measure, whichever is less, as determined by the Market Manager. Products offered at no direct cost to the customer are ineligible. Incomplete application submissions, applications requiring inspections and unanticipated high volume of activities may cause processing delays. Program Incentives are limited to \$500,000 per utility account in a calendar year. Contact the Market Manager regarding any questions.

Tax Liability – The Market Manager will not be responsible for any tax liability that may be imposed on any Participating Customer as a result of the payment of Program Incentives. All Participating Customers must supply their Federal Tax Identification number or social security number to the Market Manager on the application form in order to receive a Program Incentive. In addition, Participating Customers must also provide a Tax Clearance Form (Business Assistance or Incentive Clearance Certificate) that is dated within 90 days of equipment installation.

Endorsement – The Market Manager and Administrator do not endorse, support or recommend any particular manufacturer, product or system design in promoting this Program.

Warranties – THE MARKET MANAGER AND ADMINISTRATOR DO NOT WARRANT THE PERFORMANCE OF INSTALLED EQUIPMENT, AND/OR SERVICES RENDERED AS PART OF THIS PROGRAM, EITHER EXPRESSLY OR IMPLICITLY. NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESSED, OR IMPLIED, INCLUDING, WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING EQUIPMENT OR SERVICES PROVIDED BY A MANUFACTURER OR VENDOR. CONTACT YOUR VENDOR/SERVICES PROVIDER FOR DETAILS REGARDING PERFORMANCE AND WARRANTIES.

Limitation of Liability – By virtue of participating in this Program, Participating Customers agree to waive any and all claims or damages against the Market Manager or the Administrator, except the receipt of the Program Incentive. Participating Customers agree that the Market Manager's and Administrator's liability, in connection with this Program, is limited to paying the Program Incentive specified. Under no circumstances shall the Market Manager, its representatives, or subcontractors, or the Administrator, be liable for any lost profits, special, punitive, consequential or incidental damages or for any other damages or claims connected with or resulting from participation in this Program. Further, any liability attributed to the Market Manager under this Program shall be individual, and not joint and/or several.

Assignment – The Participating Customer may assign Program Incentive payments to a specified vendor.

Participating Customer's Certification – Participating Customer certifies that he/she purchased and installed the equipment listed in their application at their defined New Jersey location. Participating Customer agrees that all information is true and that he/she has conformed to all of the Program and equipment requirements listed in the application.

Termination – The New Jersey Board of Public Utilities reserves the right to extend, modify (this includes modification of Program Incentive levels) or terminate this Program without prior or further notice.

Acknowledgement – I have read, understood and am in compliance with all rules and regulations concerning this incentive program. I certify that all information provided is correct to the best of my knowledge, and I give the Market Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the NJ SmartStart Buildings Program. Additionally, I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for incentives under the guidelines of New Jersey's Clean Energy Program.

New Jersey Clean Energy Program

Technical Worksheet – Solar Electric Equipment Information

Please carefully read all of the following information. With the help of your Installation Contractor, fully complete Sections A through D, as applicable, of the attached Technical Worksheet for Solar Electric Equipment, as well as the New Jersey Clean Energy Program Rebate Application Form.

GENERAL TERMS AND CONDITIONS

Rebates will be processed based on the date the New Jersey Clean Energy Program (NJCEP) approves the Final Application Form, not on the purchase date of the equipment. Program procedures and rebates are subject to change or cancellation without notice.

To qualify for a rebate, Applicant must comply with all Program Eligibility Requirements, Terms and Conditions, and Installation Requirements, and submit a completed Pre-Installation Application Form. For more information about the New Jersey Clean Energy Program, or for assistance in completing applications or forms, please see www.njcleanenergy.com or call 866-NJSMART

INSTALLATION REQUIREMENTS

Equipment installation must meet the following minimum requirements in order to qualify for payment under the provisions of the New Jersey Clean Energy Program; proposed changes to the requirements will be considered, but they must be documented by the Applicant or Installation Contractor and approved by the NJCEP. These requirements are not all-encompassing and are intended only to address certain minimum safety and efficiency standards.

A: Code Requirements

1. The installation must comply with the provisions of the National Electrical Code and all other applicable local, state and federal codes or practices.
2. All required permits must be properly obtained and posted.
3. The NJCEP Inspection must be performed before the local Building Code Enforcement Office. If not, this may delay the processing of the rebate.
4. All required inspections must be performed (i.e., Electrical/NEC, Local Building Codes Enforcement Office, etc.). Note: In order to ensure compliance with provisions of the NEC, an inspection by a state-licensed electrical inspector is mandatory.

B: Solar Electric Module Array

1. Modules must be UL Listed and must be properly installed according to manufacturer's instructions.
2. The maximum amount of sunlight available year-round on a daily basis should not be obstructed. All applications must include documentation of the impact from any obstruction on the annual performance of the solar electric array. This analysis can be performed by using the New Jersey Clean Power Estimator on the program website www.njcep.com.
3. In order to qualify for program incentives, the solar electric system must adhere to a minimum design threshold, relative to the estimated system production using PVWATTS:
 - Solar electric array orientations require that the calculated system output must be at least 80% of the default output calculated by PVWatts. Additionally, all individual series strings of modules output must be at least 70% of the default output calculated by PVWatts.
 - For building integrated solar electric systems (i.e., part of the building envelope materials are comprised of solar electric components), the estimated system output must be 40% of the default output estimated by PVWATTS.
4. System wiring must be installed in accordance with the provisions of the NEC.
5. All modules installed in a series string must be installed in the same plane.

C: Inverter and Controls

1. The inverter and controls must be properly installed according to manufacturer's instructions.
2. The inverter must be certified as compliant with the requirements of IEEE 929 for small photovoltaic systems and with UL 1741.
3. The system should be equipped with the following visual indicators and/or controls:
 - On/off switch • Operating mode setting indicator • AC/DC over current protection • Operating status indicator
4. Warning labels must be posted on the control panels and junction boxes indicating that the circuits are energized by an alternate power source independent of utility-provided power.
5. Operating instructions must be posted on or near the system, or on file with facilities operation and maintenance documents.
6. Systems must have monitoring capability that is readily accessible to the owner. This monitor (meter or display) must at minimum display instantaneous and cumulative production. All projects greater than 10kW must have an output meter that meets ANSI C.12 standards

D: Control Panel to Solar Electric Array Wire Runs

1. Areas where wiring passes through ceilings, walls or other areas of the building must be properly restored, booted and sealed.
2. All interconnecting wires must be copper. (Some provisions may be made for aluminum wiring; approval must be received from utility engineering departments prior to acceptance.)
3. Thermal insulation in areas where wiring is installed must be replaced to "as found or better condition." Access doors to these areas must be properly sealed and gasketed.
4. Wiring connections must be properly made, insulated and weather-protected.
5. All wiring must be attached to the system components by the use of strain relief's or cable clamps, unless enclosed in conduit.
6. All outside wiring must be rated for wet conditions and/or encased in liquid-tight conduit.
7. Insulation on any wiring located in areas with potential high ambient temperature must be rated at 90° C or higher.
8. All wiring splices must be contained in UL-approved workboxes.

E: Batteries (If Applicable)

1. The batteries must be installed according to the manufacturer's instructions.
2. Battery terminals must be adequately protected from accidental contact.
3. DC-rated over current protection must be provided in accordance with the provisions of the NEC.

New Jersey Clean Energy Program

Technical Worksheet – Solar Electric Equipment Information

Original Application Date: _____	Revised Application Date: _____
Customer Name: _____ (Corresponding to Rebate Application Form)	Application Number: _____ (Assigned by the NJBPU)

A: EQUIPMENT INFORMATION

- Solar Electric Module Manufacturer: _____ Module Model Number: _____
- Power Rating per Module: _____ DC Watts (Refer to STC conditions) Number of Modules: _____
- Total Array Output: _____ DC Watts (No. of Modules x Power Rating)
- Inverter Manufacturer: _____ Inverter Model Number: _____
- Inverter's Continuous AC Rating: _____ AC Watts Number of Inverters: _____
- Total Inverter Output: _____ AC Watts (Inverter Continuous AC Rating x Number of Inverters)
- Inverter's Peak Efficiency: _____ (Refer to manufacturer's peak efficiency rating)

B: PROPOSED INSTALLATION/INTERCONNECTION INFORMATION

- Solar Electric Array Location: ☐ Rooftop ☐ Pole Mount or Ground Mount Location: _____
- Solar Electric Module Orientation: _____ degrees (e.g., 180 degrees magnetic south)
Note: in Central New Jersey, magnetic south compass reading is 10 degrees east of true south.
- Solar Electric Module Tilt: _____ degrees (e.g., flat mount = 0 degrees; vertical mount = 90 degrees)
- Solar Electric Module Tracking: ☐ Fixed ☐ Single-axis ☐ Double-axis
- Inverter Location: ☐ Indoor ☐ Outdoor Location: _____
- Utility-Accessible AC Disconnect Switch Location: _____
- System Type and Mode of Operation:
☐ Utility interactive (parallel/capable of back feeding the meter) ☐ with battery backup)
☐ Dedicated circuit, utility power as backup (transfer switch) ☐ with battery charging)
☐ Stand-alone (system confined to an independent circuit, no utility backup) ☐ with battery charging)

C: INCENTIVE REQUEST CALCULATION

- System rated output (Section A, line 3 above): _____ DC Watts
- Incentive Calculation (Calculate appropriate incentive based on System Rated Output):

Residential Applicants that perform Energy Efficiency Audit	Commercial, Farm, Public and Non-Profit
a. 0 to 10,000 Watts x \$1.75/Watt = \$ _____ +	0 to 50,000 Watts x \$1.00/Watt = \$ _____ +
Residential Applicants that <u>do not</u> perform Energy Efficiency Audit	
b. 0 to 10,000 Watts x \$1.55/Watt = \$ _____ +	Large PV Project Applications
	> 50,000 Watts = \$ _____ Not eligible for rebates
d. Total Rebate Calculation: \$ _____	Total Rebate Calculation: \$ _____
- School Applicants: Maximum Annual School Rebate: \$ _____
(For Public School applicants, enter the lesser value from no. 6 on the School Application form or \$50,000)
- Total Installed System Cost: \$ _____
(Eligible installed system cost includes all equipment, installation, and applicable interconnection costs before the New Jersey Clean Energy Program incentive.)
- Requested Incentive (Enter the appropriate value from C2. b or c): \$ _____

D: WARRANTY INFORMATION

- Module: _____ Years at _____ Percent of Rated Power Output
 - Inverter: _____ Years
 - Installation: _____ Years
- Revised January 2009



Incentive Structure for NJ Pay For Performance Program

Incentive #1: Energy Reduction Plan

Incentive Amount:.....\$0.10 per sq ft
 Minimum Incentive:.....\$5,000
 Maximum Incentive:.....\$50,000 or 50% of facility annual energy cost

This incentive will be developed to offset the cost of services associated with the development of the Energy Reduction Plan. Projects must identify efficiency improvements that meet the minimum performance level in order to become eligible for Incentive #1. Incentive amount will be based on the square footage of the building.

Incentive #2: Installation of Recommended Measures

Minimum Performance Target:.....15%

Electric Incentives

Base Incentive based on 15% savings:.....\$0.11 per projected kWh saved
 For each % over 15% add:.....\$0.005 per projected kWh saved
 Maximum Incentive:.....\$0.13 per projected kWh saved

Gas Incentives

Base Incentive base on 15% savings:\$1.10 per projected Therm saved
 For each % over 15% add:.....\$0.05 per projected Therm saved
 Maximum Incentive:.....\$1.45 per projected Therm saved

Incentive Cap: 30% of total project cost

This incentive will be based on projected energy savings and designed to pay approximately 60% of the total performance-based incentive. Savings projections will be calculated using calibrated energy simulation and rounded to the nearest percent. Incentive #2 may not exceed 30% of the total project cost.

Incentive #3: Post-Construction Benchmarking Report

Minimum Performance Target:.....15%

Electric Incentives

Base Incentive based on 15% savings:.....\$0.07 per projected kWh saved
 For each % over 15% add:.....\$0.005 per projected kWh saved
 Maximum Incentive:.....\$0.09 per projected kWh saved

Gas Incentives

Base Incentive base on 15% savings:\$0.70 per projected Therm saved
 For each % over 15% add:.....\$0.05 per projected Therm saved
 Maximum Incentive:.....\$1.05 per projected Therm saved

Incentive Cap: 20% of total project cost

This incentive will be released upon submittal of a Post-Construction Benchmarking Report that verifies that the level of savings actually achieved by the installed measures meets or exceeds the minimum performance threshold. To validate the savings and achievement of the Energy Target, the EPA Portfolio Manager shall be used. Savings should be rounded to the nearest percent. Total value of Incentive #2 and Incentive #3 may not exceed 50% of the total project cost. This incentive will "true up" proposed savings and the related payment for Incentive #2 so that the total incentive is based on actual savings. For buildings not covered by EPA, the process used by LEED EB shall be followed.

Advanced Measure Incentive: Combined Heat and Power

Eligible Technology	Incentive (per Watt) Max: \$1 Million	Maximum % of Project Cost
Level 1:		
Fuel cells not fueled by Class I renewable fuel	\$4.00.....	60%
Level 2:		
Microturbines	\$1.00.....	30% ⁽¹⁾
Internal Combustion Engines		
Combustion Turbines		
Level 3:		
Heat Recovery or other Mechanical Recovery from Existing Equipment	\$0.50.....	30%

(1) The maximum % of project cost will go to 40% where a cooling application is used or included with the CHP system.

Note: Incentives for renewable fueled projects (Class 1) are currently being developed. This document will be updated when the incentive levels are finalized.

APPENDIX G

FACILITY DATA FORMS

APPENDIX C - FACILITY DATA FORM

Complete one Facility Data Form for ***each*** building. If you are seeking to energy audit multiple buildings, complete one Facility Data Form for each.

FACILITY INFORMATION

Please complete the information below for this specific facility that is seeking enrollment in the Program.

Facility Name Public Library			
Street Address 49 Park Ave		County	
City Westwood	State NJ	Zip 07675	
Facility's Description			
Total Sq Ft 16,000	Year Built 1939	Hours/Week Occupied 50	Number of Employees 7
Building Type (Check only one of the following):			
☐	Emergency Services	☐	Garage
☒	Center/Meeting Hall/Library	☒	Offices
☐	Recreation/Entertainment/Parks	☐	Religious
☐	School	☐	School: College
☐	Water Treatment/Pumping	☐	Other: _____

ENERGY DATA

Please complete the energy information below for the most recent 12 month period available. In order to gain a complete picture of the facility's energy use, be sure to include all types of energy used by the facility. Do not include vehicle fuel.

The Data Below is for the 12 Month Period: ____/____/____ to ____/____/____
--



ELECTRICITY

Electric Utility Name & Account Number(s)	
PSE&G, Account # 41 775 310 06	
Annual kWh Use 126,090	Annual Electricity Cost \$23,432.20
Max Summer kW 61.8	Max Winter kW 37.5

NATURAL GAS

Natural Gas Utility Name & Account Number(s)	
PSE&G, Account # 41 775 310 06	
Annual Use in Therms 5,474	Annual Natural Gas Cost \$6,284.11

FUEL OIL

Fuel Oil Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Fuel Oil Cost

PROPANE

Propane Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Propane Cost

OTHER

In this section please indicate any other fuel type that the facility uses, such as: solar energy, wind energy, bio-fuel, cogeneration, fuel cells.

Other Fuel Type:	
Annual Energy Use (indicate units)	Annual Energy Cost

STAFF USE ONLY

Date Received: _____	Project No.: _____
----------------------	--------------------

APPENDIX C - FACILITY DATA FORM

Complete one Facility Data Form for ***each*** building. If you are seeking to energy audit multiple buildings, complete one Facility Data Form for each.

FACILITY INFORMATION

Please complete the information below for this specific facility that is seeking enrollment in the Program.

Facility Name Fire Department			
Street Address 93 Center Ave		County	
City Westwood	State NJ	Zip 07675	
Facility's Description Fire station			
Total Sq Ft 14,552	Year Built 2004	Hours/Week Occupied 20	Number of Employees 1
Building Type (Check only one of the following):			
☒	Emergency Services	☒	Garage
☐	Center/Meeting Hall/Library	☒	Offices
☐	Recreation/Entertainment/Parks	☐	Religious
☐	School	☐	School: College
☐	Water Treatment/Pumping	☐	Other: _____

ENERGY DATA

Please complete the energy information below for the most recent 12 month period available. In order to gain a complete picture of the facility's energy use, be sure to include all types of energy used by the facility. Do not include vehicle fuel.

The Data Below is for the 12 Month Period: ____/____/____ to ____/____/____
--



ELECTRICITY

Electric Utility Name & Account Number(s) PSE&G, Account # 41 816 039 03	
Annual kWh Use 129,900	Annual Electricity Cost 19,971.77
Max Summer kW 52.4	Max Winter kW 38.0

NATURAL GAS

Natural Gas Utility Name & Account Number(s) PSE&G, Account # 41 816 039 03	
Annual Use in Therms 5,212	Annual Natural Gas Cost \$7,104.07

FUEL OIL

Fuel Oil Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Fuel Oil Cost

PROPANE

Propane Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Propane Cost

OTHER

In this section please indicate any other fuel type that the facility uses, such as: solar energy, wind energy, bio-fuel, cogeneration, fuel cells.

Other Fuel Type:	
Annual Energy Use (indicate units)	Annual Energy Cost

STAFF USE ONLY

Date Received: _____	Project No.: _____
-----------------------------	---------------------------

APPENDIX C - FACILITY DATA FORM

Complete one Facility Data Form for ***each*** building. If you are seeking to energy audit multiple buildings, complete one Facility Data Form for each.

FACILITY INFORMATION

Please complete the information below for this specific facility that is seeking enrollment in the Program.

Facility Name DPW Main Building			
Street Address Sand Road		County	
City Westwood	State NJ	Zip 07675	
Facility's Description Main Building for DPW			
Total Sq Ft 8,000	Year Built 1922	Hours/Week Occupied 168	Number of Employees 11
Building Type (Check only one of the following):			
☒	Emergency Services	☒	Garage
☐	Center/Meeting Hall/Library	☒	Offices
☐	Recreation/Entertainment/Parks	☐	Religious
☐	School	☐	School: College
☐	Water Treatment/Pumping	☐	Other: _____

ENERGY DATA

Please complete the energy information below for the most recent 12 month period available. In order to gain a complete picture of the facility's energy use, be sure to include all types of energy used by the facility. Do not include vehicle fuel.

The Data Below is for the 12 Month Period: ____/____/____ to ____/____/____
--



ELECTRICITY

Electric Utility Name & Account Number(s)	
PSE&G, Account # 41 774 164 01	
Annual kWh Use 75,768	Annual Electricity Cost \$11,064.14
Max Summer kW 13.7	Max Winter kW 23.2

NATURAL GAS

Natural Gas Utility Name & Account Number(s)	
PSE&G, Account # 41 774 164 01	
Annual Use in Therms 4,655	Annual Natural Gas Cost \$6,077.36

FUEL OIL

Fuel Oil Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Fuel Oil Cost

PROPANE

Propane Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Propane Cost

OTHER

In this section please indicate any other fuel type that the facility uses, such as: solar energy, wind energy, bio-fuel, cogeneration, fuel cells.

Other Fuel Type:	
Annual Energy Use (indicate units)	Annual Energy Cost

STAFF USE ONLY

Date Received: _____	Project No.: _____

APPENDIX C - FACILITY DATA FORM

Complete one Facility Data Form for ***each*** building. If you are seeking to energy audit multiple buildings, complete one Facility Data Form for each.

FACILITY INFORMATION

Please complete the information below for this specific facility that is seeking enrollment in the Program.

Facility Name DPW Garage			
Street Address Sand Road		County	
City Westwood	State NJ	Zip 07675	
Facility's Description Garage for DPW			
Total Sq Ft 6,000	Year Built 1996	Hours/Week Occupied 5-10	Number of Employees 11
Building Type (Check only one of the following):			
☐	Emergency Services	☒	Garage
☐	Center/Meeting Hall/Library	☐	Offices
☐	Recreation/Entertainment/Parks	☐	Religious
☐	School	☐	School: College
☐	Water Treatment/Pumping	☐	Other: _____

ENERGY DATA

Please complete the energy information below for the most recent 12 month period available. In order to gain a complete picture of the facility's energy use, be sure to include all types of energy used by the facility. Do not include vehicle fuel.

The Data Below is for the 12 Month Period: ____/____/____ to ____/____/____
--



ELECTRICITY

Electric Utility Name & Account Number(s) PSE&G, Account # 41 774 161 18	
Annual kWh Use 16,601	Annual Electricity Cost \$2,666.73
Max Summer kW 4.1	Max Winter kW 9.7

NATURAL GAS

Natural Gas Utility Name & Account Number(s) PSE&G, Account # 41 774 161 18	
Annual Use in Therms 2,069	Annual Natural Gas Cost \$2,733.52

FUEL OIL

Fuel Oil Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Fuel Oil Cost

PROPANE

Propane Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Propane Cost

OTHER

In this section please indicate any other fuel type that the facility uses, such as: solar energy, wind energy, bio-fuel, cogeneration, fuel cells.

Other Fuel Type:	
Annual Energy Use (indicate units)	Annual Energy Cost

STAFF USE ONLY

Date Received: _____	Project No.: _____
-----------------------------	---------------------------

APPENDIX C - FACILITY DATA FORM

Complete one Facility Data Form for ***each*** building. If you are seeking to energy audit multiple buildings, complete one Facility Data Form for each.

FACILITY INFORMATION

Please complete the information below for this specific facility that is seeking enrollment in the Program.

Facility Name Borough Hall			
Street Address 101 Washington Ave		County	
City Westwood	State NJ	Zip 07675	
Facility's Description Borough Hall for the Borough of Westwood			
Total Sq Ft 29,780	Year Built 1994	Hours/Week Occupied 168	Number of Employees 51
Building Type (Check only one of the following):			
☐	Emergency Services	☐	Garage
☐	Center/Meeting Hall/Library	☒	Offices
☐	Recreation/Entertainment/Parks	☐	Religious
☐	School	☐	School: College
☐	Water Treatment/Pumping	☐	Other: _____

ENERGY DATA

Please complete the energy information below for the most recent 12 month period available. In order to gain a complete picture of the facility's energy use, be sure to include all types of energy used by the facility. Do not include vehicle fuel.

The Data Below is for the 12 Month Period: ____/____/____ to ____/____/____
--



ELECTRICITY

Electric Utility Name & Account Number(s) PSE&G, Account # 41 815 006 08	
Annual kWh Use 357,920	Annual Electricity Cost \$55,739
Max Summer kW 128	Max Winter kW 56

NATURAL GAS

Natural Gas Utility Name & Account Number(s) PSE&G, Account # 41 815 006 08	
Annual Use in Therms 9,561	Annual Natural Gas Cost \$12,325

FUEL OIL

Fuel Oil Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Fuel Oil Cost

PROPANE

Propane Utility Name & Account Number(s)	
Annual Use in Gallons	Annual Propane Cost

OTHER

In this section please indicate any other fuel type that the facility uses, such as: solar energy, wind energy, bio-fuel, cogeneration, fuel cells.

Other Fuel Type:	
Annual Energy Use (indicate units)	Annual Energy Cost

STAFF USE ONLY

Date Received: _____	Project No.: _____
-----------------------------	---------------------------

APPENDIX H

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Borough of Westwood
Estimate by: PS
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Borough Hall Interior Lighting Upgrades	1	ls.		\$ 24,626.00	1	ls.	\$ 26,807.50	\$ 26,807.50	\$ 51,433.50
	Subtotal				24,626.00				26,807.50	

SUBTOTAL = \$ 51,433.50
MARKUP % = \$ 0.15
MARKUP = \$ 7,715.03
SUB-TOTAL w/ OH & P = \$ 59,148.53
CONTINGENCY % = 0.25
CONTINGENCY = \$ 14,787.13
BUDGET COST ESTIMATE = \$ 73,935.66

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
2	Borough Hall Exterior Lighting Upgrades	1	ls.		\$ 10,590.00	1	ls.	\$ 3,390.00	\$ 3,390.00	\$ 13,980.00
	Subtotal				10,590.00				3,390.00	

SUBTOTAL = \$ 13,980.00
MARKUP % = \$ 0.15
MARKUP = \$ 2,097.00
SUB-TOTAL w/ OH & P = \$ 16,077.00
CONTINGENCY % = 0.25
CONTINGENCY = \$ 4,019.25
BUDGET COST ESTIMATE = \$ 20,096.25

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
3	Borough Hall Combined Lighting Upgrades	1	ls.		\$ 35,216.00	1	ls.	\$ 30,197.50	\$ 30,197.50	\$ 65,413.50
	Subtotal				35,216.00				30,197.50	

SUBTOTAL = \$ 65,413.50
MARKUP % = \$ 0.15
MARKUP = \$ 9,812.03
SUB-TOTAL w/ OH & P = \$ 75,225.53
CONTINGENCY % = 0.25
CONTINGENCY = \$ 18,806.38
BUDGET COST ESTIMATE = \$ 94,031.91

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Borough of Westwood
Estimate by: PS
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Library Interior Lighting Upgrades	1	ls.		\$ 11,689.50	1	ls.	\$ 7,809.00	\$ 7,809.00	\$ 19,498.50
	Subtotal				11,689.50				7,809.00	

SUBTOTAL = \$ 19,498.50
MARKUP % = \$ 0.15
MARKUP = \$ 2,924.78
SUB-TOTAL w/ OH & P = \$ 22,423.28
CONTINGENCY % = 0.25
CONTINGENCY = \$ 5,605.82
BUDGET COST ESTIMATE = \$ 28,029.09

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
2	Public Library Exterior Lighting Upgrades	1	ls.		\$ 2,288.00	1	ls.	\$ 810.00	\$ 810.00	\$ 3,098.00
	Subtotal				2,288.00				810.00	

SUBTOTAL = \$ 3,098.00
MARKUP % = \$ 0.15
MARKUP = \$ 464.70
SUB-TOTAL w/ OH & P = \$ 3,562.70
CONTINGENCY % = 0.25
CONTINGENCY = \$ 890.68
BUDGET COST ESTIMATE = \$ 4,453.38

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
3	Public Library Combined Lighting Upgrades	1	ls.		\$ 13,977.50	1	ls.	\$ 8,619.00	\$ 8,619.00	\$ 22,596.50
	Subtotal				13,977.50				8,619.00	

SUBTOTAL = \$ 22,596.50
MARKUP % = \$ 0.15
MARKUP = \$ 3,389.48
SUB-TOTAL w/ OH & P = \$ 25,985.98
CONTINGENCY % = 0.25
CONTINGENCY = \$ 6,496.49
BUDGET COST ESTIMATE = \$ 32,482.47

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Borough of Westwood
Estimate by: PS
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	DPW Main Building Interior Lighting Upgrades	1	ls.		\$ 5,554.50	1	ls.	\$ 3,237.00	\$ 3,237.00	\$ 8,791.50
	Subtotal				5,554.50				3,237.00	

SUBTOTAL = \$ 8,791.50
MARKUP % = \$ 0.15
MARKUP = \$ 1,318.73
SUB-TOTAL w/ OH & P = \$ 10,110.23
CONTINGENCY % = 0.25
CONTINGENCY = \$ 2,527.56
BUDGET COST ESTIMATE = \$ 12,637.78

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
2	DPW Main Building Exterior Lighting Upgrades	1	ls.		\$ 3,385.00	1	ls.	\$ 1,018.00	\$ 1,018.00	\$ 4,403.00
	Subtotal				3,385.00				1,018.00	

SUBTOTAL = \$ 4,403.00
MARKUP % = \$ 0.15
MARKUP = \$ 660.45
SUB-TOTAL w/ OH & P = \$ 5,063.45
CONTINGENCY % = 0.25
CONTINGENCY = \$ 1,265.86
BUDGET COST ESTIMATE = \$ 6,329.31

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
3	DPW Main Building Combined Lighting Upgrades	1	ls.		\$ 8,939.50	1	ls.	\$ 4,255.00	\$ 4,255.00	\$ 13,194.50
	Subtotal				8,939.50				4,255.00	

SUBTOTAL = \$ 13,194.50
MARKUP % = \$ 0.15
MARKUP = \$ 1,979.18
SUB-TOTAL w/ OH & P = \$ 15,173.68
CONTINGENCY % = 0.25
CONTINGENCY = \$ 3,793.42
BUDGET COST ESTIMATE = \$ 18,967.09

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Borough of Westwood
Estimate by: PS
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	DPW Garage Interior Lighting Upgrades	1	ls.		\$ 963.00	1	ls.	\$ 1,166.00	\$ 1,166.00	\$ 2,129.00
	Subtotal				963.00				1,166.00	

SUBTOTAL = \$ 2,129.00
MARKUP % = \$ 0.15
MARKUP = \$ 319.35
SUB-TOTAL w/ OH & P = \$ 2,448.35
CONTINGENCY % = 0.25
CONTINGENCY = \$ 612.09
BUDGET COST ESTIMATE = \$ 3,060.44

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
2	DPW Garage Exterior Lighting Upgrades	1	ls.		\$ 790.00	1	ls.	\$ 308.00	\$ 308.00	\$ 1,098.00
	Subtotal				790.00				308.00	

SUBTOTAL = \$ 1,098.00
MARKUP % = \$ 0.15
MARKUP = \$ 164.70
SUB-TOTAL w/ OH & P = \$ 1,262.70
CONTINGENCY % = 0.25
CONTINGENCY = \$ 315.68
BUDGET COST ESTIMATE = \$ 1,578.38

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
3	DPW Garage Combined Lighting Upgrades	1	ls.		\$ 1,753.00	1	ls.	\$ 1,474.00	\$ 1,474.00	\$ 3,227.00
	Subtotal				1,753.00				1,474.00	

SUBTOTAL = \$ 3,227.00
MARKUP % = \$ 0.15
MARKUP = \$ 484.05
SUB-TOTAL w/ OH & P = \$ 3,711.05
CONTINGENCY % = 0.25
CONTINGENCY = \$ 927.76
BUDGET COST ESTIMATE = \$ 4,638.81

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Borough of Westwood
Estimate by: PS
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Fire Department Interior Lighting Upgrades	1	ls.		\$ 4,866.50	1	ls.	\$ 3,436.50	\$ 3,436.50	\$ 8,303.00
	Subtotal				4,866.50				3,436.50	

SUBTOTAL = \$ 8,303.00
MARKUP % = \$ 0.15
MARKUP = \$ 1,245.45
SUB-TOTAL w/ OH & P = \$ 9,548.45
CONTINGENCY % = 0.25
CONTINGENCY = \$ 2,387.11
BUDGET COST ESTIMATE = \$ 11,935.56

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
2	Fire Department Exterior Lighting Upgrades	1	ls.		\$ 5,062.00	1	ls.	\$ 1,594.00	\$ 1,594.00	\$ 6,656.00
	Subtotal				5,062.00				1,594.00	

SUBTOTAL = \$ 6,656.00
MARKUP % = \$ 0.15
MARKUP = \$ 998.40
SUB-TOTAL w/ OH & P = \$ 7,654.40
CONTINGENCY % = 0.25
CONTINGENCY = \$ 1,913.60
BUDGET COST ESTIMATE = \$ 9,568.00

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
3	Fire Department Combined Lighting Upgrades	1	ls.		\$ 9,928.50	1	ls.	\$ 5,030.50	\$ 5,030.50	\$ 14,959.00
	Subtotal				9,928.50				5,030.50	

SUBTOTAL = \$ 14,959.00
MARKUP % = \$ 0.15
MARKUP = \$ 2,243.85
SUB-TOTAL w/ OH & P = \$ 17,202.85
CONTINGENCY % = 0.25
CONTINGENCY = \$ 4,300.71
BUDGET COST ESTIMATE = \$ 21,503.56

CDM

15 British American Blvd
 Latham, NY 12110
 Phone (518) 782-4500
 Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
 Estimate by: RKA
 Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Borough Hall Boiler, Gas-Fired, Condensing High Efficiency, 2,000 MBH*	1	ea.	\$ 34,000.00	\$ 34,000.00	1	ea.	\$ 5,750.00	\$ 5,750.00	\$ 39,750.00
2	Removal of Existing Cast Iron Boiler New Flue, all fuel, pressure tight, double wall, U.L. listed, 1400 deg F, 304 stainless steel liner, aluminized steel outer jacket, 6" dia	1	ea.	\$0	\$ -	1	ea.	\$ 5,425.00	\$ 5,425.00	\$ 5,425.00
3		30	LF	\$ 47.00	\$ 1,410.00	30	LF	\$ 15.35	\$ 460.50	\$ 1,870.50
	Subtotal				35,410.00				11,635.50	

*Pricing from boiler manufacturer quote, dated May, 2009

All other pricing per RS Means Costworks 2010

SUBTOTAL = \$ 47,045.50
 MARKUP % = \$ 0.15
 MARKUP = \$ 7,056.83
 SUB-TOTAL w/ OH & P = \$ 54,102.33
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 13,525.58
 BUDGET COST ESTIMATE = \$ 67,627.91

CDM

15 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
Estimate by: RKA
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL & LABOR UNIT COST	MATERIAL & LABOR SUBTOTAL	TOTAL
1	Borough Hall DDC Control System	29,780	SF	\$ 0.60	\$ 17,868.00	\$ 17,868.00
	Subtotal				17,868.00	

Notes:

- DDC Control System Pricing is estimated at \$0.60 per square foot
- At an assumed \$400 per control point, this will allow for 64 points, or roughly 7 per air handler

SUBTOTAL =	\$	17,868.00
MARKUP % =	\$	0.15
MARKUP =	\$	2,680.20
SUB-TOTAL w/ OH & P =	\$	20,548.20
CONTINGENCY % =		0.25
CONTINGENCY =	\$	5,137.05
BUDGET COST ESTIMATE =	\$	25,685.25

CDM

15 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
Estimate by: RKA
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Borough Hall									
1	Water source to air, Single Package, 10 ton cooling, 50 MBH @ 75°F (Replace AHU - 4, 5, 6, 7, 8, & 9)	6	ea.	\$ 8,225.00	\$ 49,350.00	6	ea.	\$ 1,800.00	\$ 10,800.00	\$ 60,150.00
2	Water source to air, Single Package, 7.5 ton cooling, 35 MBH @ 75°F(Replace AHU - 1, 2, & 3)	3	ea.	\$ 6,500.00	\$ 19,500.00	3	ea.	\$ 1,600.00	\$ 4,800.00	\$ 24,300.00
3	Removal of AHU - 1, 2, 3, 4, 5, 6, 7, 8 & 9	9	ea.	\$ -	\$ -	9	ea.	\$ 1,850.00	\$ 16,650.00	\$ 16,650.00
4	Geothermal well, 500' depth, 6" bore*	32	ea.	\$ 11,812.50	\$ 378,000.00	32	ea.	\$ -	\$ -	\$ 378,000.00
	Subtotal									

SUBTOTAL = \$ 479,100.00

MARKUP % = \$ 0.15

MARKUP = \$ 71,865.00

SUB-TOTAL w/ OH & P = \$ 550,965.00

CONTINGENCY % = 0.25

CONTINGENCY = \$ 137,741.25

BUDGET COST ESTIMATE = \$ 688,706.25

Pricing per RSMeans Costworks 2010

*Wells estimated at 200' per Ton, ~81 total tons, 500' wells, test well drilling would be required to verify accuracy of this estimate, well cost estimate includes material and labor

CDM

15 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
Estimate by: RKA
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Library Boiler, Gas-Fired, Condensing High Efficiency, 194 MBH	4	ea.	\$ 2,675.00	\$ 10,700.00	4	ea.	\$ 1,250.00	\$ 5,000.00	\$ 15,700.00
2	Removal of Existing Cast Iron Boiler New Flue, all fuel, pressure tight, double wall, U.L. listed, 1400 deg F, 304 stainless steel liner, aluminized steel outer jacket, 6" dia	1	ea.	\$0	\$ -	1	ea.	\$ 4,775.00	\$ 4,775.00	\$ 4,775.00
3		30	LF	\$ 47.00	\$ 1,410.00	30	LF	\$ 15.35	\$ 460.50	\$ 1,870.50
	Subtotal				12,110.00				10,235.50	

All pricing per RS Means Costworks 2010

SUBTOTAL = \$ 22,345.50
MARKUP % = \$ 0.15
MARKUP = \$ 3,351.83
SUB-TOTAL w/ OH & P = \$ 25,697.33
CONTINGENCY % = 0.25
CONTINGENCY = \$ 6,424.33
BUDGET COST ESTIMATE = \$ 32,121.66

CDM

15 British American Blvd
 Latham, NY 12110
 Phone (518) 782-4500
 Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
 Estimate by: RKA
 Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL & LABOR UNIT COST	MATERIAL & LABOR SUBTOTAL	TOTAL
1	Public Library DDC Control System	16,000	SF	\$ 0.60	\$ 9,600.00	\$ 9,600.00
	Subtotal				9,600.00	

Notes:

- DDC Control System Pricing is estimated at \$0.60 per square foot
- At an assumed \$400 per control point, this will allow for 35 points, or roughly 7 per air handler

SUBTOTAL =	\$	9,600.00
MARKUP % =	\$	0.15
MARKUP =	\$	1,440.00
SUB-TOTAL w/ OH & P =	\$	11,040.00
CONTINGENCY % =		0.25
CONTINGENCY =	\$	2,760.00
BUDGET COST ESTIMATE =	\$	13,800.00

CDM

15 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
Estimate by: RKA
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Library Water source to air, Single Package, 10 ton cooling, 50 MBH @ 75°F (Replace AHUs serving Children's Section and Lower Level Auditorium)	2	ea.	\$ 8,225.00	\$ 16,450.00	2	ea.	\$ 1,800.00	\$ 3,600.00	\$ 20,050.00
2	Water source to air, Single Package, 7.5 ton cooling, 35 MBH @ 75°F (Replace AHU serving Office/Reception area)	3	ea.	\$ 6,500.00	\$ 19,500.00	3	ea.	\$ 1,600.00	\$ 4,800.00	\$ 24,300.00
3	Water source to air, Single Package, 15 ton cooling, 64 MBH @ 75°F (Replace AHU serving Adult's Section area)	1	ea.	\$ 14,000.00	\$ 14,000.00	1	ea.	\$ 3,175.00	\$ 3,175.00	\$ 17,175.00
3	Removal of four AHUs	4	ea.	\$ -	\$ -	4	ea.	\$ 1,850.00	\$ 7,400.00	\$ 7,400.00
4	Geothermal well, 500' depth, 6" bore*	19	ea.	\$ 11,812.50	\$ 218,531.25	168	ea.	\$ -	\$ -	\$ 218,531.25
	Subtotal									

SUBTOTAL = \$ 287,456.25
 MARKUP % = \$ 0.15
 MARKUP = \$ 43,118.44
 SUB-TOTAL w/ OH & P = \$ 330,574.69
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 82,643.67
 BUDGET COST ESTIMATE = \$ 413,218.36

Pricing per RSMeans Costworks 2010

*Wells estimated at 200' per Ton, ~46 total tons, 500' wells, test well drilling would be required to verify accuracy of this estimate, well cost estimate includes material and labor

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Borough of Westwood
Estimate by: PS
Checked by: JTM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Borough Hall Solar PV System	1	Is.		\$ 285,838.00	1	Is.	\$ 122,502.00	\$ 122,502.00	\$ 408,340.00
	Subtotal				285,838.00				122,502.00	

SUBTOTAL = \$ 408,340.00
CONTINGENCY % = 0.25
CONTINGENCY = \$ 102,085.00
BUDGET COST ESTIMATE = \$ 510,425.00

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Library Solar PV System	1	Is.		\$ 176,092.00	1	Is.	\$ 75,468.00	\$ 75,468.00	\$ 251,560.00
	Subtotal				176,092.00				75,468.00	

SUBTOTAL = \$ 251,560.00
CONTINGENCY % = 0.25
CONTINGENCY = \$ 62,890.00
BUDGET COST ESTIMATE = \$ 314,450.00

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	DPW Main Building Solar PV System	1	Is.		\$ 416,626.00	1	Is.	\$ 178,554.00	\$ 178,554.00	\$ 595,180.00
	Subtotal				416,626.00				178,554.00	

SUBTOTAL = \$ 595,180.00
CONTINGENCY % = 0.25
CONTINGENCY = \$ 148,795.00
BUDGET COST ESTIMATE = \$ 743,975.00

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Borough of Westwood
Estimate by: PS
Checked by: JTM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	DPW Garage Solar PV System	1	Is.		\$ 142,450.00	1	Is.	\$ 61,050.00	\$ 61,050.00	\$ 203,500.00
	Subtotal				142,450.00				61,050.00	

SUBTOTAL = \$ 203,500.00
CONTINGENCY % = 0.25
CONTINGENCY = \$ 50,875.00
BUDGET COST ESTIMATE = \$ 254,375.00

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Fire Department Solar PV System	1	Is.		\$ 146,356.00	1	Is.	\$ 62,724.00	\$ 62,724.00	\$ 209,080.00
	Subtotal				146,356.00				62,724.00	

SUBTOTAL = \$ 209,080.00
CONTINGENCY % = 0.25
CONTINGENCY = \$ 52,270.00
BUDGET COST ESTIMATE = \$ 261,350.00

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Borough of Westwood
Estimate by: PS
Checked by: JTM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Borough of Westwood 10KW Wind Turbine	1	Is.		\$ 43,645.00	1	Is.	\$ 4,000.00	\$ 4,000.00	\$ 47,645.00
	Subtotal				43,645.00				4,000.00	

SUBTOTAL = \$ 47,645.00
MARKUP % = \$ 0.15
MARKUP = \$ 7,146.75
SUB-TOTAL w/ OH & P = \$ 54,791.75
CONTINGENCY % = 0.25
CONTINGENCY = \$ 13,697.94
BUDGET COST ESTIMATE = \$ 68,489.69

CDM

15 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
Estimate by: RKA
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Library High efficiency automatic flush sensor and operator for urinals, 0.5 gpf	0	ea.	\$ 395.00	\$ -	0	ea.	\$ 65.50	\$ -	\$ -
2	High efficiency automatic flush sensor and operator for water closets, 1.28 gpf	5	ea.	\$ 395.00	\$ 1,975.00	5	ea.	\$ 65.50	\$ 327.50	\$ 2,302.50
3	Faucet - Automatic sensor and operator with faucet head	5	ea.	\$ 370.00	\$ 1,850.00	5	ea.	\$ 85.50	\$ 427.50	\$ 2,277.50
	Subtotal				3,825.00				755.00	

Pricing from RS Means Costworks 2010

SUBTOTAL = \$ 4,580.00
MARKUP % = \$ 0.15
MARKUP = \$ 687.00
SUB-TOTAL w/ OH & P = \$ 5,267.00
CONTINGENCY % = 0.25
CONTINGENCY = \$ 1,316.75
BUDGET COST ESTIMATE = \$ 6,583.75

CDM

15 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
Estimate by: RKA
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Fire Department High efficiency automatic flush sensor and operator for urinals, 0.5 gpf	0	ea.	\$ 395.00	\$ -	0	ea.	\$ 65.50	\$ -	\$ -
2	High efficiency automatic flush sensor and operator for water closets, 1.28 gpf	11	ea.	\$ 395.00	\$ 4,345.00	11	ea.	\$ 65.50	\$ 720.50	\$ 5,065.50
3	Faucet - Automatic sensor and operator with faucet head	16	ea.	\$ 370.00	\$ 5,920.00	16	ea.	\$ 85.50	\$ 1,368.00	\$ 7,288.00
	Subtotal				10,265.00				2,088.50	

Pricing from RS Means Costworks 2010

SUBTOTAL = \$ 12,353.50
MARKUP % = \$ 0.15
MARKUP = \$ 1,853.03
SUB-TOTAL w/ OH & P = \$ 14,206.53
CONTINGENCY % = 0.25
CONTINGENCY = \$ 3,551.63
BUDGET COST ESTIMATE = \$ 17,758.16

CDM

15 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
Estimate by: RKA
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	DPW Garages High efficiency automatic flush sensor and operator for urinals, 0.5 gpf	0	ea.	\$ 395.00	\$ -	0	ea.	\$ 65.50	\$ -	\$ -
2	High efficiency automatic flush sensor and operator for water closets, 1.28 gpf	6	ea.	\$ 395.00	\$ 2,370.00	6	ea.	\$ 65.50	\$ 393.00	\$ 2,763.00
3	Faucet - Automatic sensor and operator with faucet head	7	ea.	\$ 370.00	\$ 2,590.00	7	ea.	\$ 85.50	\$ 598.50	\$ 3,188.50
	Subtotal				4,960.00				991.50	

Pricing from RS Means Costworks 2010

SUBTOTAL = \$ 5,951.50
MARKUP % = \$ 0.15
MARKUP = \$ 892.73
SUB-TOTAL w/ OH & P = \$ 6,844.23
CONTINGENCY % = 0.25
CONTINGENCY = \$ 1,711.06
BUDGET COST ESTIMATE = \$ 8,555.28

CDM

15 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Borough of Westwood
Estimate by: RKA
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Borough Hall High efficiency automatic flush sensor and operator for urinals, 0.5 gpf	8	ea.	\$ 395.00	\$ 3,160.00	8	ea.	\$ 65.50	\$ 524.00	\$ 3,684.00
2	High efficiency automatic flush sensor and operator for water closets, 1.28 gpf	11	ea.	\$ 395.00	\$ 4,345.00	11	ea.	\$ 65.50	\$ 720.50	\$ 5,065.50
3	Faucet - Automatic sensor and operator with faucet head	13	ea.	\$ 370.00	\$ 4,810.00	13	ea.	\$ 85.50	\$ 1,111.50	\$ 5,921.50
	Subtotal				12,315.00				2,356.00	

Pricing from RS Means Costworks 2010

SUBTOTAL = \$ 14,671.00
MARKUP % = \$ 0.15
MARKUP = \$ 2,200.65
SUB-TOTAL w/ OH & P = \$ 16,871.65
CONTINGENCY % = 0.25
CONTINGENCY = \$ 4,217.91
BUDGET COST ESTIMATE = \$ 21,089.56

APPENDIX I

ECRM FINANCIAL ANALYSES

IRR, NPV, AROI (HVAC)

Inflation Rate: 3%

Borough Hall Boiler Upgrade		Borough Hall DDC BMS		Public Library Boiler Upgrade		Public Library DDC BMS		Borough Hall GSHP		Public Library GSHP	
Life of ECRM (Yrs): 24		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 24		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 19		Life of ECRM (Yrs): 19	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$65,628.00)	0	(\$25,685.00)	0	(\$30,570.00)	0	(\$13,800.00)	0	(\$658,736.00)	0	(\$396,198.00)
1	\$5,464.00	1	\$2,737.00	1	\$2,853.00	1	\$826.00	1	\$6,139.00	1	\$6,965.00
2	\$5,627.92	2	\$2,819.11	2	\$2,938.59	2	\$850.78	2	\$6,323.17	2	\$7,173.95
3	\$5,796.76	3	\$2,903.68	3	\$3,026.75	3	\$876.30	3	\$6,512.87	3	\$7,389.17
4	\$5,970.66	4	\$2,990.79	4	\$3,117.55	4	\$902.59	4	\$6,708.25	4	\$7,610.84
5	\$6,149.78	5	\$3,080.52	5	\$3,211.08	5	\$929.67	5	\$6,909.50	5	\$7,839.17
6	\$6,334.27	6	\$3,172.93	6	\$3,307.41	6	\$957.56	6	\$7,116.78	6	\$8,074.34
7	\$6,524.30	7	\$3,268.12	7	\$3,406.63	7	\$986.29	7	\$7,330.29	7	\$8,316.57
8	\$6,720.03	8	\$3,366.16	8	\$3,508.83	8	\$1,015.88	8	\$7,550.20	8	\$8,566.07
9	\$6,921.63	9	\$3,467.15	9	\$3,614.10	9	\$1,046.35	9	\$7,776.70	9	\$8,823.05
10	\$7,129.28	10	\$3,571.16	10	\$3,722.52	10	\$1,077.74	10	\$8,010.00	10	\$9,087.75
11	\$7,343.16	11	\$3,678.30	11	\$3,834.19	11	\$1,110.07	11	\$8,250.30	11	\$9,360.38
12	\$7,563.45	12	\$3,788.65	12	\$3,949.22	12	\$1,143.38	12	\$8,497.81	12	\$9,641.19
13	\$7,790.36	13	\$3,902.31	13	\$4,067.70	13	\$1,177.68	13	\$8,752.75	13	\$9,930.42
14	\$8,024.07	14	\$4,019.38	14	\$4,189.73	14	\$1,213.01	14	\$9,015.33	14	\$10,228.34
15	\$8,264.79	15	\$4,139.96	15	\$4,315.42	15	\$1,249.40	15	\$9,285.79	15	\$10,535.19
16	\$8,512.73			16	\$4,444.88			16	\$9,564.36	16	\$10,851.24
17	\$8,768.12			17	\$4,578.23			17	\$9,851.29	17	\$11,176.78
18	\$9,031.16			18	\$4,715.57			18	\$10,146.83	18	\$11,512.08
19	\$9,302.09			19	\$4,857.04			19	\$10,451.24	19	\$11,857.45
20	\$9,581.16			20	\$5,002.75						
21	\$9,868.59			21	\$5,152.84						
22	\$10,164.65			22	\$5,307.42						
23	\$10,469.59			23	\$5,466.64						
24	\$10,783.68			24	\$5,630.64						
IRR	9.34%	IRR	9.26%	IRR	7.23%	IRR	1.28%	IRR	-16.03%	IRR	-6.66%
NPV	\$61,688.50	NPV	\$14,174.22	NPV	\$35,907.67	NPV	(\$1,770.87)	NPV	(\$545,492.31)	NPV	(\$267,717.42)
AROI	4.16%	AROI	3.99%	AROI	5.17%	AROI	-0.68%	AROI	-4.33%	AROI	-3.51%

ECRM	Borough Hall Boiler Upgrade	Borough Hall DDC BMS	Public Library Boiler Upgrade	Public Library DDC BMS	Borough Hall GSHP	Public Library GSHP
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)	\$3,964.00	\$1,482.00	\$1,353.00	\$364.00	\$14,697.00	\$6,108.00
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)		\$1,255.00		\$462.00	-\$8,558.00	\$857.00
Assumed Average Useful Life (Years)	24	15	24	15	19	19
Lifetime Savings	\$120,592.26	\$48,970.48	\$41,160.78	\$14,887.50	\$120,737.53	\$161,035.29
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$3,964.00	\$2,737.00	\$1,353.00	\$826.00	\$6,139.00	\$6,965.00
2	\$4,043.28	\$2,804.29	\$1,380.06	\$847.14	\$6,176.20	\$7,112.87
3	\$4,124.15	\$2,873.30	\$1,407.66	\$868.84	\$6,211.58	\$7,263.95
4	\$4,206.63	\$2,944.08	\$1,435.81	\$891.12	\$6,245.02	\$7,418.33
5	\$4,290.76	\$3,016.68	\$1,464.53	\$913.99	\$6,276.40	\$7,576.06
6	\$4,376.58	\$3,091.14	\$1,493.82	\$937.47	\$6,305.61	\$7,737.22
7	\$4,464.11	\$3,167.51	\$1,523.70	\$961.58	\$6,332.51	\$7,901.90
8	\$4,553.39	\$3,245.84	\$1,554.17	\$986.32	\$6,356.97	\$8,070.17
9	\$4,644.46	\$3,326.20	\$1,585.26	\$1,011.73	\$6,378.86	\$8,242.12
10	\$4,737.35	\$3,408.62	\$1,616.96	\$1,037.82	\$6,398.03	\$8,417.82
11	\$4,832.09	\$3,493.16	\$1,649.30	\$1,064.60	\$6,414.32	\$8,597.35
12	\$4,928.74	\$3,579.89	\$1,682.29	\$1,092.10	\$6,427.60	\$8,780.82
13	\$5,027.31	\$3,668.86	\$1,715.93	\$1,120.34	\$6,437.69	\$8,968.30
14	\$5,127.86	\$3,760.13	\$1,750.25	\$1,149.34	\$6,444.43	\$9,159.88
15	\$5,230.41	\$3,853.77	\$1,785.25	\$1,179.11	\$6,447.64	\$9,355.67
16	\$5,335.02		\$1,820.96		\$6,447.14	\$9,555.74
17	\$5,441.72		\$1,857.38		\$6,442.75	\$9,760.21
18	\$5,550.56		\$1,894.53		\$6,434.28	\$9,969.17
19	\$5,661.57		\$1,932.42		\$6,421.51	\$10,182.71
20	\$5,774.80		\$1,971.07			
21	\$5,890.30		\$2,010.49			
22	\$6,008.10		\$2,050.70			
23	\$6,128.26		\$2,091.71			
24	\$6,250.83		\$2,133.54			
25						

Lighting Maintenance Cost Savings

T12 to T8 Retrofit	T12 Bulb Cost	T8 Bulb Cost	T12 Bulb Average Lifetime (Years)	T8 Bulb Average Lifetime (Years)	Quantity of T12 Replacements vs. T8 Replacements	Cost of T12 Replacement over T8 Life	T8 Bulb Replacements Over Lifetime (15 Yrs)
1 Lamp	\$25.0	\$23.5	4.6	5.7	1.25	\$31.2	3
2 Lamp	\$69.9	\$67.0	4.6	5.7	1.25	\$87.4	3
3 Lamp	\$94.9	\$90.5	4.6	5.7	1.25	\$118.6	3
4 Lamp	\$119.8	\$114.0	4.6	5.7	1.25	\$149.8	3

Incandescent to CFL Retrofit	Incandescent Cost	CFL Cost	Incandescent Average Lifetime (Years)	CFL Average Lifetime (Years)	Quantity of Incandescent Replacements vs. CFL Replacements	Cost of Incandescent Replacement over CFL Life	CFL Replacements Over Lifetime (15 Yrs)
13 Watt	\$23.0	\$25.0	0.5	2.3	5	\$115.0	7
15 Par 38 Watt	\$23.0	\$35.0	0.5	2.3	5	\$115.0	7
23 Par 38 Watt	\$23.0	\$40.0	0.5	2.3	5	\$115.0	7
25 Watt	\$23.0	\$27.0	0.5	2.3	5	\$115.0	7
40 Watt	\$23.0	\$32.0	0.5	2.3	5	\$115.0	7
65 Watt	\$23.4	\$45.0	0.5	2.3	5	\$117.0	7

Metal Halide to Induction Retrofit	Metal Halide Cost	Induction Cost	Metal Halide Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Induction Replacements	Cost of Metal Halide Replacement over Induction Life	LED Replacements Over Lifetime (15 Yrs)
400 Watt	\$86.0	\$485.0	4.6	22.8	5	\$430.0	1
250 Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1

HPS to Induction Retrofit	HPS Cost	Induction Cost	HPS Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of HPS Replacements vs. Induction Replacements	Cost of HPS over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
150 Watt	\$74.0	\$440.0	4.6	22.8	5	\$370.0	1
100 Watt	\$55.0	\$380.0	4.6	22.8	5	\$275.0	1
70 Watt	\$25.0	\$380.0	4.6	22.8	5	\$125.0	1

High Pressure Sodium/Metal Halide to Fluorescent	Metal Halide Cost	Fluorescent Cost	Metal Halide Average Lifetime (Years)	Fluorescent Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Fluorescent Replacements	Cost of Metal Halide Replacement over Fluorescent Life	Fluorescent Replacements Over Lifetime (15 Yrs)
4 Lamp	\$86.0	\$216.0	4.6	5.7	1.25	\$107.4	3
6 Lamp	\$86.0	\$288.0	4.6	5.7	1.25	\$107.5	3

Interior Option

Building	INC-CFL (13W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	T12->T8 (4 Lamp)	MH->Fluorescent	INC-CFL (25W)	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Borough Hall	\$1,057.8	\$196.7	\$5,602.8	\$436.2	\$1,889.0	\$0.0	\$9,519.9	\$18,702.4	\$1,246.83	Borough Hall
Public Library	\$2,820.7	\$0.0	\$1,928.8	\$747.8	\$3,620.6	\$0.0	\$0.0	\$9,117.9	\$607.86	Public Library
DPW Main Building	\$0.0	\$0.0	\$275.5	\$0.0	\$2,833.5	\$0.0	\$0.0	\$3,109.1	\$207.27	DPW Main Building
DPW Garage	\$0.0	\$0.0	\$642.9	\$0.0	\$0.0	\$0.0	\$705.2	\$1,348.1	\$89.87	DPW Garage
Fire Department	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$339.0	\$0.0	\$339.0	\$22.60	Fire Department

Exterior Option

Building	MH->Induction (400W)	INC->CFL (25W)	HPS->Induction (100/150W)	HPS->Induction (70W)	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Borough Hall	\$207.2	\$705.2	\$178.3	\$11.0	\$1,101.6	\$73.44	Borough Hall
Public Library	\$0.0	\$3,173.3	\$81.0	\$0.0	\$3,254.3	\$216.96	Public Library
DPW Main Building	\$94.2	\$4,231.1	\$0.0	\$11.0	\$4,336.2	\$289.08	DPW Main Building
DPW Garage	\$0.0	\$705.2	\$0.0	\$11.0	\$716.1	\$47.74	DPW Garage
Fire Department	\$150.7	\$2,115.5	\$0.0	\$16.4	\$2,282.6	\$152.18	Fire Department

ECM	Borough Hall-Interior	Public Library-Interior	DPW Main Building-Interior	DPW Garage-Interior	Fire Department-Interior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)					
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$5,791.99	\$3,595.62	\$1,054.86	\$164.52	\$819.92
Assumed Average Useful Life (Years)	15	15	15	15	15
Lifetime Savings	\$107,724.72	\$66,874.63	\$19,619.25	\$3,059.89	\$15,249.62
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$5,791.99	\$3,595.62	\$1,054.86	\$164.52	\$819.92
2	\$5,965.75	\$3,703.49	\$1,086.51	\$169.46	\$844.52
3	\$6,144.72	\$3,814.59	\$1,119.10	\$174.54	\$869.85
4	\$6,329.06	\$3,929.03	\$1,152.67	\$179.78	\$895.95
5	\$6,518.94	\$4,046.90	\$1,187.25	\$185.17	\$922.83
6	\$6,714.50	\$4,168.31	\$1,222.87	\$190.72	\$950.51
7	\$6,915.94	\$4,293.36	\$1,259.56	\$196.45	\$979.03
8	\$7,123.42	\$4,422.16	\$1,297.34	\$202.34	\$1,008.40
9	\$7,337.12	\$4,554.82	\$1,336.27	\$208.41	\$1,038.65
10	\$7,557.23	\$4,691.47	\$1,376.35	\$214.66	\$1,069.81
11	\$7,783.95	\$4,832.21	\$1,417.64	\$221.10	\$1,101.90
12	\$8,017.47	\$4,977.18	\$1,460.17	\$227.73	\$1,134.96
13	\$8,257.99	\$5,126.49	\$1,503.98	\$234.57	\$1,169.01
14	\$8,505.73	\$5,280.29	\$1,549.10	\$241.60	\$1,204.08
15	\$8,760.90	\$5,438.70	\$1,595.57	\$248.85	\$1,240.20

ECM	Borough Hall-Exterior	Public Library-Exterior	DPW Main Building-Exterior	DPW Garage-Exterior	Fire Department-Exterior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)					
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$2,343.50	\$915.28	\$1,262.08	\$128.48	\$771.94
Assumed Average Useful Life (Years)	15	15	15	15	15
Lifetime Savings	\$43,586.55	\$17,023.21	\$23,473.32	\$2,389.59	\$14,357.25
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$2,343.50	\$915.28	\$1,262.08	\$128.48	\$771.94
2	\$2,413.81	\$942.74	\$1,299.94	\$132.33	\$795.10
3	\$2,486.22	\$971.02	\$1,338.94	\$136.30	\$818.95
4	\$2,560.81	\$1,000.15	\$1,379.11	\$140.39	\$843.52
5	\$2,637.63	\$1,030.16	\$1,420.48	\$144.61	\$868.83
6	\$2,716.76	\$1,061.06	\$1,463.10	\$148.94	\$894.89
7	\$2,798.26	\$1,092.89	\$1,506.99	\$153.41	\$921.74
8	\$2,882.21	\$1,125.68	\$1,552.20	\$158.01	\$949.39
9	\$2,968.68	\$1,159.45	\$1,598.77	\$162.75	\$977.87
10	\$3,057.74	\$1,194.23	\$1,646.73	\$167.64	\$1,007.21
11	\$3,149.47	\$1,230.06	\$1,696.13	\$172.67	\$1,037.42
12	\$3,243.95	\$1,266.96	\$1,747.01	\$177.85	\$1,068.55
13	\$3,341.27	\$1,304.97	\$1,799.42	\$183.18	\$1,100.60
14	\$3,441.51	\$1,344.12	\$1,853.41	\$188.68	\$1,133.62
15	\$3,544.75	\$1,384.44	\$1,909.01	\$194.34	\$1,167.63

ECM	Borough Hall-Interior & Exterior	Public Library-Interior & Exterior	DPW Main Building-Interior & Exterior	DPW Garage-Interior & Exterior	Fire Department-Interior & Exterior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)					
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$8,135.49	\$4,510.90	\$2,316.95	\$292.99	\$1,591.86
Assumed Average Useful Life (Years)	15	15	15	15	15
Lifetime Savings	\$151,311.28	\$83,897.84	\$43,092.75	\$5,449.30	\$29,606.87
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$8,135.49	\$4,510.90	\$2,316.95	\$292.99	\$1,591.86
2	\$8,379.55	\$4,646.23	\$2,386.46	\$301.78	\$1,639.62
3	\$8,630.94	\$4,785.61	\$2,458.05	\$310.83	\$1,688.80
4	\$8,889.87	\$4,929.18	\$2,531.79	\$320.16	\$1,739.47
5	\$9,156.57	\$5,077.06	\$2,607.75	\$329.76	\$1,791.65
6	\$9,431.26	\$5,229.37	\$2,685.98	\$339.66	\$1,845.40
7	\$9,714.20	\$5,386.25	\$2,766.56	\$349.85	\$1,900.76
8	\$10,005.63	\$5,547.84	\$2,849.56	\$360.34	\$1,957.79
9	\$10,305.80	\$5,714.27	\$2,935.04	\$371.15	\$2,016.52
10	\$10,614.97	\$5,885.70	\$3,023.09	\$382.29	\$2,077.02
11	\$10,933.42	\$6,062.27	\$3,113.79	\$393.75	\$2,139.33
12	\$11,261.42	\$6,244.14	\$3,207.20	\$405.57	\$2,203.51
13	\$11,599.26	\$6,431.46	\$3,303.42	\$417.73	\$2,269.61
14	\$11,947.24	\$6,624.41	\$3,402.52	\$430.27	\$2,337.70
15	\$12,305.66	\$6,823.14	\$3,504.59	\$443.17	\$2,407.83

ECM	Borough Hall-PV Solar System	Public Library-PV Solar System	DPW Main Building-PV Solar System	DPW Garage-PV Solar System	Fire Department-PV Solar System
Assumed Inflation (Gas)					
Initial Yearly Savings (Gas)					
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$6,113.70	\$3,735.80	\$9,805.30	\$2,460.80	\$2,152.70
Assumed Average Useful Life (Years)	25	25	25	25	25
Lifetime Savings	\$222,901.00	\$136,204.52	\$357,494.02	\$89,718.96	\$78,485.86
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$6,113.70	\$3,735.80	\$9,805.30	\$2,460.80	\$2,152.70
2	\$6,297.11	\$3,847.87	\$10,099.46	\$2,534.62	\$2,217.28
3	\$6,486.02	\$3,963.31	\$10,402.44	\$2,610.66	\$2,283.80
4	\$6,680.61	\$4,082.21	\$10,714.52	\$2,688.98	\$2,352.31
5	\$6,881.02	\$4,204.68	\$11,035.95	\$2,769.65	\$2,422.88
6	\$7,087.45	\$4,330.82	\$11,367.03	\$2,852.74	\$2,495.57
7	\$7,300.08	\$4,460.74	\$11,708.04	\$2,938.32	\$2,570.44
8	\$7,519.08	\$4,594.56	\$12,059.28	\$3,026.47	\$2,647.55
9	\$7,744.65	\$4,732.40	\$12,421.06	\$3,117.27	\$2,726.98
10	\$7,976.99	\$4,874.37	\$12,793.69	\$3,210.79	\$2,808.79
11	\$8,216.30	\$5,020.60	\$13,177.50	\$3,307.11	\$2,893.05
12	\$8,462.79	\$5,171.22	\$13,572.83	\$3,406.32	\$2,979.84
13	\$8,716.67	\$5,326.36	\$13,980.01	\$3,508.51	\$3,069.24
14	\$8,978.17	\$5,486.15	\$14,399.41	\$3,613.77	\$3,161.31
15	\$9,247.52	\$5,650.73	\$14,831.40	\$3,722.18	\$3,256.15
16	\$9,524.95	\$5,820.25	\$15,276.34	\$3,833.85	\$3,353.84
17	\$9,810.69	\$5,994.86	\$15,734.63	\$3,948.86	\$3,454.45
18	\$10,105.01	\$6,174.71	\$16,206.67	\$4,067.33	\$3,558.09
19	\$10,408.17	\$6,359.95	\$16,692.87	\$4,189.35	\$3,664.83
20	\$10,720.41	\$6,550.75	\$17,193.65	\$4,315.03	\$3,774.77
21	\$11,042.02	\$6,747.27	\$17,709.46	\$4,444.48	\$3,888.02
22	\$11,373.28	\$6,949.69	\$18,240.75	\$4,577.81	\$4,004.66
23	\$11,714.48	\$7,158.18	\$18,787.97	\$4,715.15	\$4,124.80
24	\$12,065.92	\$7,372.92	\$19,351.61	\$4,856.60	\$4,248.54
25	\$12,427.89	\$7,594.11	\$19,932.16	\$5,002.30	\$4,376.00

ECM	Wind Turbine - Min Wind Speed	Wind Turbine - Max Wind Speed	Wind Turbine - Avg wind Speed
Assumed Inflation (Gas)			
Initial Yearly Savings (Gas)			
Assumed Inflation (Electricity)	3%	3%	3%
Initial Yearly Savings (Electricity)	\$846.10	\$2,401.60	\$1,579.50
Assumed Average Useful Life (Years)	25	25	25
Lifetime Savings	\$30,848.18	\$87,560.57	\$57,587.41
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$846.10	\$2,401.60	\$1,579.50
2	\$871.48	\$2,473.65	\$1,626.89
3	\$897.63	\$2,547.86	\$1,675.69
4	\$924.56	\$2,624.29	\$1,725.96
5	\$952.29	\$2,703.02	\$1,777.74
6	\$980.86	\$2,784.11	\$1,831.07
7	\$1,010.29	\$2,867.64	\$1,886.01
8	\$1,040.60	\$2,953.67	\$1,942.59
9	\$1,071.81	\$3,042.28	\$2,000.86
10	\$1,103.97	\$3,133.54	\$2,060.89
11	\$1,137.09	\$3,227.55	\$2,122.72
12	\$1,171.20	\$3,324.38	\$2,186.40
13	\$1,206.34	\$3,424.11	\$2,251.99
14	\$1,242.53	\$3,526.83	\$2,319.55
15	\$1,279.80	\$3,632.64	\$2,389.14
16	\$1,318.20	\$3,741.61	\$2,460.81
17	\$1,357.74	\$3,853.86	\$2,534.63
18	\$1,398.47	\$3,969.48	\$2,610.67
19	\$1,440.43	\$4,088.56	\$2,688.99
20	\$1,483.64	\$4,211.22	\$2,769.66
21	\$1,528.15	\$4,337.56	\$2,852.75
22	\$1,574.00	\$4,467.68	\$2,938.34
23	\$1,621.22	\$4,601.71	\$3,026.49
24	\$1,669.85	\$4,739.77	\$3,117.28
25	\$1,719.95	\$4,881.96	\$3,210.80

IRR, NPV, AROI

Inflation Rate: 3%

Lighting - Interior Borough Hall	Lighting - Interior Public Library	Lighting - Interior DPW Main Building	Lighting - Interior DPW Garage	Lighting - Interior Fire Department
Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15
Year Cash Flow	Year Cash Flow	Year Cash Flow	Year Cash Flow	Year Cash Flow
0 (\$70,335.70)	0 (\$26,189.10)	0 (\$11,867.80)	0 (\$2,790.40)	0 (\$10,765.60)
1 \$7,038.80	1 \$4,203.50	1 \$1,262.20	1 \$254.40	1 \$842.50
2 \$7,249.96	2 \$4,329.61	2 \$1,300.07	2 \$262.03	2 \$867.78
3 \$7,467.46	3 \$4,459.49	3 \$1,339.07	3 \$269.89	3 \$893.81
4 \$7,691.49	4 \$4,593.28	4 \$1,379.24	4 \$277.99	4 \$920.62
5 \$7,922.23	5 \$4,731.08	5 \$1,420.62	5 \$286.33	5 \$948.24
6 \$8,159.90	6 \$4,873.01	6 \$1,463.24	6 \$294.92	6 \$976.69
7 \$8,404.70	7 \$5,019.20	7 \$1,507.13	7 \$303.77	7 \$1,005.99
8 \$8,656.84	8 \$5,169.77	8 \$1,552.35	8 \$312.88	8 \$1,036.17
9 \$8,916.54	9 \$5,324.87	9 \$1,598.92	9 \$322.27	9 \$1,067.25
10 \$9,184.04	10 \$5,484.61	10 \$1,646.88	10 \$331.93	10 \$1,099.27
11 \$9,459.56	11 \$5,649.15	11 \$1,696.29	11 \$341.89	11 \$1,132.25
12 \$9,743.35	12 \$5,818.63	12 \$1,747.18	12 \$352.15	12 \$1,166.22
13 \$10,035.65	13 \$5,993.19	13 \$1,799.60	13 \$362.71	13 \$1,201.20
14 \$10,336.72	14 \$6,172.98	14 \$1,853.58	14 \$373.59	14 \$1,237.24
15 \$10,646.82	15 \$6,358.17	15 \$1,909.19	15 \$384.80	15 \$1,274.36
IRR 8.28%	IRR 16.53%	IRR 9.23%	IRR 6.89%	IRR 4.73%
NPV \$32,171.10	NPV \$35,026.92	NPV \$6,513.75	NPV \$914.45	NPV \$1,503.82
AROI 3.34%	AROI 9.38%	AROI 3.97%	AROI 2.45%	AROI 1.16%

Lighting - Exterior Borough Hall	Lighting - Exterior Public Library	Lighting - Exterior DPW Main Building	Lighting - Exterior DPW Garage	Lighting - Exterior Fire Department
Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15
Year Cash Flow	Year Cash Flow	Year Cash Flow	Year Cash Flow	Year Cash Flow
0 (\$18,626.30)	0 (\$4,082.40)	0 (\$5,769.30)	0 (\$1,564.40)	0 (\$9,008.00)
1 \$2,416.90	1 \$1,132.30	1 \$1,551.20	1 \$176.20	1 \$924.10
2 \$2,489.41	2 \$1,166.27	2 \$1,597.74	2 \$181.49	2 \$951.82
3 \$2,564.09	3 \$1,201.26	3 \$1,645.67	3 \$186.93	3 \$980.38
4 \$2,641.01	4 \$1,237.29	4 \$1,695.04	4 \$192.54	4 \$1,009.79
5 \$2,720.24	5 \$1,274.41	5 \$1,745.89	5 \$198.31	5 \$1,040.08
6 \$2,801.85	6 \$1,312.65	6 \$1,798.27	6 \$204.26	6 \$1,071.29
7 \$2,885.90	7 \$1,352.03	7 \$1,852.21	7 \$210.39	7 \$1,103.42
8 \$2,972.48	8 \$1,392.59	8 \$1,907.78	8 \$216.70	8 \$1,136.53
9 \$3,061.66	9 \$1,434.36	9 \$1,965.01	9 \$223.20	9 \$1,170.62
10 \$3,153.51	10 \$1,477.39	10 \$2,023.96	10 \$229.90	10 \$1,205.74
11 \$3,248.11	11 \$1,521.72	11 \$2,084.68	11 \$236.80	11 \$1,241.91
12 \$3,345.55	12 \$1,567.37	12 \$2,147.22	12 \$243.90	12 \$1,279.17
13 \$3,445.92	13 \$1,614.39	13 \$2,211.64	13 \$251.22	13 \$1,317.55
14 \$3,549.30	14 \$1,662.82	14 \$2,277.99	14 \$258.76	14 \$1,357.07
15 \$3,655.78	15 \$1,712.71	15 \$2,346.33	15 \$266.52	15 \$1,397.78
IRR 12.54%	IRR 29.88%	IRR 28.96%	IRR 10.14%	IRR 8.66%
NPV \$16,571.27	NPV \$12,407.41	NPV \$16,820.99	NPV \$1,001.62	NPV \$4,449.77
AROI 6.31%	AROI 21.07%	AROI 20.22%	AROI 4.60%	AROI 3.59%

Lighting - Interior & Exterior Borough Hall	Lighting - Interior & Exterior Public Library	Lighting - Interior & Exterior DPW Main Building	Lighting - Interior & Exterior DPW Garage	Lighting - Interior & Exterior Fire Department
Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15	Life of ECRM (Yrs): 15
Year Cash Flow	Year Cash Flow	Year Cash Flow	Year Cash Flow	Year Cash Flow
0 (\$88,961.90)	0 (\$30,271.50)	0 (\$17,637.10)	0 (\$4,354.80)	0 (\$19,773.60)
1 \$9,455.80	1 \$5,335.70	1 \$2,813.30	1 \$430.60	1 \$1,766.70
2 \$9,739.47	2 \$5,495.77	2 \$2,897.70	2 \$443.52	2 \$1,819.70
3 \$10,031.66	3 \$5,660.64	3 \$2,984.63	3 \$456.82	3 \$1,874.29
4 \$10,332.61	4 \$5,830.46	4 \$3,074.17	4 \$470.53	4 \$1,930.52
5 \$10,642.59	5 \$6,005.38	5 \$3,166.39	5 \$484.64	5 \$1,988.44
6 \$10,961.86	6 \$6,185.54	6 \$3,261.39	6 \$499.18	6 \$2,048.09
7 \$11,290.72	7 \$6,371.10	7 \$3,359.23	7 \$514.16	7 \$2,109.53
8 \$11,629.44	8 \$6,562.24	8 \$3,460.00	8 \$529.58	8 \$2,172.82
9 \$11,978.32	9 \$6,759.11	9 \$3,563.80	9 \$545.47	9 \$2,238.00
10 \$12,337.67	10 \$6,961.88	10 \$3,670.72	10 \$561.84	10 \$2,305.14
11 \$12,707.80	11 \$7,170.73	11 \$3,780.84	11 \$578.69	11 \$2,374.30
12 \$13,089.04	12 \$7,385.86	12 \$3,894.27	12 \$596.05	12 \$2,445.53
13 \$13,481.71	13 \$7,607.43	13 \$4,011.09	13 \$613.93	13 \$2,518.99
14 \$13,886.16	14 \$7,835.66	14 \$4,131.43	14 \$632.35	14 \$2,594.46
15 \$14,302.75	15 \$8,070.72	15 \$4,255.37	15 \$651.32	15 \$2,672.29
IRR 9.22%	IRR 18.46%	IRR 16.41%	IRR 8.10%	IRR 6.59%
NPV \$48,743.93	NPV \$47,432.87	NPV \$23,333.29	NPV \$1,916.07	NPV \$5,955.04
AROI 3.96%	AROI 10.96%	AROI 9.28%	AROI 3.22%	AROI 2.27%

IRR, NPV, AROI - Solar PV Energy Systems

Financial Calculations

Based on inflation of: 3%
O&M inflation: 3%

Solar PV System Borough Hall				Solar PV System Public Library				Solar PV System DPW Main Building				Solar PV System DPW Garage				Solar PV System Fire Department			
Life of ECRM (Yrs):				Life of ECRM (Yrs):				Life of ECRM (Yrs):				Life of ECRM (Yrs):				Life of ECRM (Yrs):			
Year	Energy Savings	SREC Sales	25 Cash Flow (\$10,425)	Year	Energy Savings	SREC Sales	25 Cash Flow (\$131,450)	Year	Energy Savings	SREC Sales	25 Cash Flow (\$743,975)	Year	Energy Savings	SREC Sales	25 Cash Flow (\$254,375)	Year	Energy Savings	SREC Sales	25 Cash Flow (\$261,350)
0				0				0				0				0			
1	\$6,113.7	\$27,790	\$33,903.50	1	\$3,735.8	\$13,660	\$17,395.73	1	\$9,805.3	\$44,630	\$54,434.95	1	\$2,460.8	\$9,513	\$11,974.26	1	\$2,152.7	\$9,831	\$11,984.08
2	\$6,265.7	\$26,960	\$33,225.20	2	\$3,828.6	\$13,252	\$17,080.47	2	\$10,049.0	\$43,296	\$53,345.30	2	\$2,522.0	\$9,229	\$11,751.20	2	\$2,206.2	\$9,538	\$11,743.86
3	\$6,421.4	\$26,146	\$32,567.44	3	\$3,923.7	\$12,852	\$16,775.75	3	\$10,298.7	\$41,990	\$52,288.61	3	\$2,584.6	\$8,951	\$11,535.39	3	\$2,261.0	\$9,250	\$11,510.90
4	\$6,580.9	\$25,235	\$31,815.82	4	\$4,021.2	\$12,404	\$16,425.36	4	\$10,554.6	\$40,527	\$51,081.19	4	\$2,648.9	\$8,639	\$11,287.69	4	\$2,317.2	\$8,928	\$11,244.73
5	\$6,744.5	\$24,355	\$31,099.92	5	\$4,121.2	\$11,972	\$16,093.01	5	\$10,816.9	\$39,114	\$49,931.12	5	\$2,714.7	\$8,338	\$11,052.45	5	\$2,374.8	\$8,616	\$10,991.19
6	\$6,912.1	\$23,507	\$30,418.74	6	\$4,223.6	\$11,555	\$15,778.20	6	\$11,085.7	\$37,751	\$48,836.79	6	\$2,782.1	\$8,047	\$10,829.34	6	\$2,433.8	\$8,216	\$10,749.92
7	\$7,083.8	\$22,687	\$29,771.29	7	\$4,328.5	\$11,152	\$15,480.47	7	\$11,361.2	\$36,435	\$47,796.64	7	\$2,851.3	\$7,767	\$10,618.03	7	\$2,494.3	\$8,026	\$10,520.59
8	\$7,259.9	\$21,897	\$29,156.67	8	\$4,436.1	\$10,763	\$15,199.39	8	\$11,643.5	\$35,166	\$46,809.19	8	\$2,922.1	\$7,496	\$10,418.21	8	\$2,556.3	\$7,747	\$10,302.85
9	\$7,440.3	\$21,134	\$28,573.98	9	\$4,546.3	\$10,388	\$14,934.53	9	\$11,932.8	\$33,940	\$45,873.00	9	\$2,994.8	\$7,235	\$10,229.59	9	\$2,619.8	\$7,477	\$10,096.41
10	\$7,625.2	\$20,397	\$28,022.36	10	\$4,659.3	\$10,026	\$14,685.48	10	\$12,229.4	\$32,757	\$44,986.72	10	\$3,069.2	\$6,983	\$10,051.87	10	\$2,684.9	\$7,216	\$9,900.95
11	\$7,814.7	\$19,686	\$27,501.00	11	\$4,775.1	\$9,677	\$14,451.85	11	\$12,533.3	\$31,616	\$44,149.02	11	\$3,145.4	\$6,739	\$9,894.80	11	\$2,751.6	\$6,965	\$9,716.19
12	\$8,008.9	\$19,000	\$27,009.13	12	\$4,893.7	\$9,340	\$14,233.27	12	\$12,844.7	\$30,514	\$43,358.67	12	\$3,223.6	\$6,504	\$9,728.09	12	\$2,820.0	\$6,722	\$9,541.85
13	\$8,207.9	\$18,338	\$26,545.99	13	\$5,015.4	\$9,014	\$14,029.40	13	\$13,163.9	\$29,451	\$42,614.45	13	\$3,303.7	\$6,278	\$9,581.52	13	\$2,890.1	\$6,488	\$9,377.67
14	\$8,411.8	\$17,699	\$26,110.87	14	\$5,140.0	\$8,700	\$13,839.89	14	\$13,491.0	\$28,424	\$41,915.22	14	\$3,385.8	\$6,059	\$9,444.83	14	\$2,961.9	\$6,262	\$9,223.40
15	\$8,620.9	\$17,082	\$25,703.09	15	\$5,267.7	\$8,397	\$13,664.43	15	\$13,826.3	\$27,434	\$41,259.89	15	\$3,469.9	\$5,848	\$9,317.81	15	\$3,035.5	\$6,043	\$9,078.79
16	\$8,835.1	\$955	\$9,789.81	16	\$5,398.6	\$469	\$5,867.90	16	\$14,169.9	\$1,533	\$15,703.08	16	\$3,556.2	\$327	\$3,883.00	16	\$3,110.9	\$338	\$3,448.68
17	\$9,054.7	\$950	\$10,004.59	17	\$5,532.8	\$467	\$5,999.71	17	\$14,522.0	\$1,526	\$16,047.54	17	\$3,644.5	\$325	\$3,969.74	17	\$3,188.2	\$336	\$3,524.29
18	\$9,278.7	\$945	\$10,224.85	18	\$5,670.3	\$465	\$6,134.86	18	\$14,882.8	\$1,518	\$16,400.78	18	\$3,735.1	\$324	\$4,058.68	18	\$3,267.5	\$334	\$3,601.84
19	\$9,510.3	\$940	\$10,450.72	19	\$5,811.2	\$462	\$6,273.44	19	\$15,252.7	\$1,510	\$16,763.03	19	\$3,827.9	\$322	\$4,149.88	19	\$3,348.7	\$333	\$3,681.37
20	\$9,746.6	\$936	\$10,682.35	20	\$5,955.6	\$460	\$6,415.54	20	\$15,631.7	\$1,503	\$17,134.51	20	\$3,923.1	\$320	\$4,243.40	20	\$3,431.9	\$331	\$3,762.92
21	\$9,988.8	\$931	\$10,919.87	21	\$6,103.6	\$458	\$6,561.24	21	\$16,020.2	\$1,495	\$17,515.44	21	\$4,020.5	\$319	\$4,339.28	21	\$3,517.2	\$329	\$3,846.54
22	\$10,237.0	\$926	\$11,163.44	22	\$6,255.2	\$455	\$6,710.62	22	\$16,418.3	\$1,488	\$17,906.06	22	\$4,120.5	\$317	\$4,437.60	22	\$3,604.6	\$328	\$3,932.30
23	\$10,491.4	\$922	\$11,413.20	23	\$6,410.7	\$453	\$6,863.79	23	\$16,826.3	\$1,480	\$18,306.62	23	\$4,222.8	\$316	\$4,538.41	23	\$3,694.1	\$326	\$4,020.23
24	\$10,752.1	\$917	\$11,669.30	24	\$6,570.0	\$451	\$7,020.83	24	\$17,244.4	\$1,473	\$18,717.35	24	\$4,327.8	\$314	\$4,641.77	24	\$3,785.9	\$324	\$4,110.40
25	\$11,019.3	\$913	\$11,931.90	25	\$6,733.3	\$449	\$7,181.94	25	\$17,672.9	\$1,466	\$19,138.51	25	\$4,435.3	\$312	\$4,747.74	25	\$3,860.0	\$323	\$4,202.96
IRR 0.7%				IRR -0.0%				IRR 1.8%				IRR 2.1%				IRR -2.7%			
NPV (\$96,242.71)				NPV (\$94,152.13)				NPV (\$79,110.92)				NPV (\$104,172.47)				NPV (\$115,054.99)			
AROI 2.6%				AROI 1.5%				AROI 3.3%				AROI 0.7%				AROI 0.6%			

IRR, NPV, AROI - Wind Energy Systems

Financial Calculations

Based on inflation of: 3%

O&M inflation: 3%

Wind Turbine - Minimum Wind Speed				
REIP Incentive:		\$18,256		
Year	Energy Savings	REC Sales	Cash Flow	
0			(\$50,234)	
1	\$846.1	\$143	\$989	
2	\$867.1	\$142	\$1,009	
3	\$888.6	\$141	\$1,030	
4	\$910.7	\$140	\$1,051	
5	\$933.3	\$140	\$1,073	
6	\$956.5	\$139	\$1,096	
7	\$980.3	\$138	\$1,119	
8	\$1,004.7	\$138	\$1,142	
9	\$1,029.6	\$137	\$1,167	
10	\$1,055.2	\$136	\$1,192	
11	\$1,081.4	\$136	\$1,217	
12	\$1,108.3	\$135	\$1,243	
13	\$1,135.8	\$134	\$1,270	
14	\$1,164.1	\$134	\$1,298	
15	\$1,193.0	\$133	\$1,326	
16	\$1,222.6	\$132	\$1,355	
17	\$1,253.0	\$132	\$1,385	
18	\$1,284.2	\$131	\$1,415	
19	\$1,316.1	\$130	\$1,446	
20	\$1,348.8	\$130	\$1,478	
21	\$1,382.3	\$129	\$1,511	
22	\$1,416.7	\$128	\$1,545	
23	\$1,451.9	\$128	\$1,580	
24	\$1,487.9	\$127	\$1,615	
25	\$1,524.9	\$126	\$1,651	
IRR			-2.9%	
NPV			-\$28,527	
AROI			-2.0%	

Wind Turbine - Maximum Wind Speed				
REIP Incentive:		\$51,297		
Year	Energy Savings	REC Sales	Cash Flow	
0			(\$17,193)	
1	\$2,401.6	\$405	\$2,806	
2	\$2,461.2	\$403	\$2,864	
3	\$2,522.4	\$401	\$2,923	
4	\$2,585.1	\$399	\$2,984	
5	\$2,649.3	\$397	\$3,046	
6	\$2,715.2	\$395	\$3,110	
7	\$2,782.6	\$393	\$3,175	
8	\$2,851.8	\$391	\$3,243	
9	\$2,922.7	\$389	\$3,312	
10	\$2,995.3	\$387	\$3,382	
11	\$3,069.7	\$385	\$3,455	
12	\$3,146.0	\$383	\$3,529	
13	\$3,224.2	\$381	\$3,605	
14	\$3,304.3	\$379	\$3,684	
15	\$3,386.4	\$377	\$3,764	
16	\$3,470.6	\$376	\$3,846	
17	\$3,556.8	\$374	\$3,930	
18	\$3,645.2	\$372	\$4,017	
19	\$3,735.8	\$370	\$4,106	
20	\$3,828.6	\$368	\$4,197	
21	\$3,923.8	\$366	\$4,290	
22	\$4,021.3	\$364	\$4,386	
23	\$4,121.2	\$363	\$4,484	
24	\$4,223.6	\$361	\$4,584	
25	\$4,328.6	\$359	\$4,688	
IRR			18.0%	
NPV			\$44,424	
AROI			12.3%	

Wind Turbine - Average Wind Speed				
REIP Incentive:		\$34,083		
Year	Energy Savings	REC Sales	Cash Flow	
0			(\$34,406)	
1	\$1,579.5	\$266	\$1,846	
2	\$1,618.8	\$265	\$1,884	
3	\$1,659.0	\$264	\$1,923	
4	\$1,700.2	\$262	\$1,963	
5	\$1,742.5	\$261	\$2,003	
6	\$1,785.8	\$260	\$2,045	
7	\$1,830.2	\$258	\$2,089	
8	\$1,875.7	\$257	\$2,133	
9	\$1,922.3	\$256	\$2,178	
10	\$1,970.0	\$255	\$2,225	
11	\$2,019.0	\$253	\$2,272	
12	\$2,069.2	\$252	\$2,321	
13	\$2,120.6	\$251	\$2,371	
14	\$2,173.3	\$249	\$2,423	
15	\$2,227.3	\$248	\$2,476	
16	\$2,282.6	\$247	\$2,530	
17	\$2,339.4	\$246	\$2,585	
18	\$2,397.5	\$245	\$2,642	
19	\$2,457.1	\$243	\$2,700	
20	\$2,518.1	\$242	\$2,760	
21	\$2,580.7	\$241	\$2,822	
22	\$2,644.8	\$240	\$2,885	
23	\$2,710.6	\$238	\$2,949	
24	\$2,777.9	\$237	\$3,015	
25	\$2,846.9	\$236	\$3,083	
IRR			4.4%	
NPV			\$6,120	
AROI			1.4%	

IRR, NPV, AROI (Water Fixtures)

Inflation Rate: 3%

Borough Hall		Public Library		DPW Garages		Fire Department	
Flushometers/Sensors		Flushometers/Sensors		Flushometers/Sensors		Flushometers/Sensors	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$21,090.00)	0	(\$6,584.00)	0	(\$8,555.00)	0	(\$17,758.00)
1	\$484.00	1	\$57.00	1	\$90.00	1	\$8.00
2	\$498.52	2	\$58.71	2	\$92.70	2	\$8.24
3	\$513.48	3	\$60.47	3	\$95.48	3	\$8.49
4	\$528.88	4	\$62.29	4	\$98.35	4	\$8.74
5	\$544.75	5	\$64.15	5	\$101.30	5	\$9.00
6	\$561.09	6	\$66.08	6	\$104.33	6	\$9.27
7	\$577.92	7	\$68.06	7	\$107.46	7	\$9.55
8	\$595.26	8	\$70.10	8	\$110.69	8	\$9.84
9	\$613.12	9	\$72.21	9	\$114.01	9	\$10.13
10	\$631.51	10	\$74.37	10	\$117.43	10	\$10.44
11	\$650.46	11	\$76.60	11	\$120.95	11	\$10.75
12	\$669.97	12	\$78.90	12	\$124.58	12	\$11.07
13	\$690.07	13	\$81.27	13	\$128.32	13	\$11.41
14	\$710.77	14	\$83.71	14	\$132.17	14	\$11.75
15	\$732.09	15	\$86.22	15	\$136.13	15	\$12.10
IRR	-8.69%	IRR	-16.57%	IRR	-15.12%	IRR	-34.18%
NPV	(\$14,041.46)	NPV	(\$5,753.90)	NPV	(\$7,244.32)	NPV	(\$17,641.50)
AROI	-4.37%	AROI	-5.80%	AROI	-5.61%	AROI	-6.62%

ECRM	Borough Hall Flushometers/Sensors	Public Library Flushometers/Sensors	DPW Garages Flushometers/Sensors	Fire Department Flushometers/Sensors
Assumed Inflation (Water)	3%	3%	3%	3%
Initial Yearly Savings (Water)	\$484.00	\$57.00	\$90.00	\$8.00
Assumed Average Useful Life (Years)	15	15	15	15
Lifetime Savings	\$9,001.87	\$1,060.14	\$1,673.90	\$148.79
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$484.00	\$57.00	\$90.00	\$8.00
2	\$498.52	\$58.71	\$92.70	\$8.24
3	\$513.48	\$60.47	\$95.48	\$8.49
4	\$528.88	\$62.29	\$98.35	\$8.74
5	\$544.75	\$64.15	\$101.30	\$9.00
6	\$561.09	\$66.08	\$104.33	\$9.27
7	\$577.92	\$68.06	\$107.46	\$9.55
8	\$595.26	\$70.10	\$110.69	\$9.84
9	\$613.12	\$72.21	\$114.01	\$10.13
10	\$631.51	\$74.37	\$117.43	\$10.44
11	\$650.46	\$76.60	\$120.95	\$10.75
12	\$669.97	\$78.90	\$124.58	\$11.07
13	\$690.07	\$81.27	\$128.32	\$11.41
14	\$710.77	\$83.71	\$132.17	\$11.75
15	\$732.09	\$86.22	\$136.13	\$12.10
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

APPENDIX J

WIND CAD MODELING

WindCad Turbine Performance Model

BWC EXCEL-S, Grid - Intertie

Tier/neo-SH3055-23-BWC

Prepared For: **Borough of Westwood**

Site Location: **DPW Grounds**

Data Source: **NASA**

Date: **3/31/2010**

10 kW

Inputs:

Ave. Wind (m/s) = 4.72
Weibull K = 2
Site Altitude (m) = 72
Wind Shear Exp. = 0.180
Anem. Height (m) = 30
Tower Height (m) = 30
Turbulence Factor = 5.0%

Results:

Hub Average Wind Speed (m/s) = 4.72
Air Density Factor = -1%
Average Output Power (kW) = 1.22
Daily Energy Output (kWh) = 29.2
Annual Energy Output (kWh) = **10,651**
Monthly Energy Output = 888
Percent Operating Time = 64.7%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	6.86%	0.000
2	0.00	12.34%	0.000
3	0.13	15.49%	0.020
4	0.41	16.10%	0.065
5	0.83	14.62%	0.121
6	1.43	11.86%	0.169
7	2.22	8.72%	0.193
8	3.24	5.84%	0.189
9	4.53	3.59%	0.163
10	6.06	2.03%	0.123
11	7.75	1.06%	0.082
12	9.46	0.51%	0.048
13	10.73	0.23%	0.024
14	11.10	0.09%	0.010
15	11.38	0.04%	0.004
16	11.46	0.01%	0.001
17	11.47	0.00%	0.000
18	11.42	0.00%	0.000
19	11.25	0.00%	0.000
20	10.80	0.00%	0.000
Totals:		99.41%	1.216

Weibull Calculations:

Wind speed probability is calculated as a Weibull curve defined by the average wind speed and a shape factor, K. To facilitate piece-wise integration, the wind speed range is broken down into "bins" of 1 m/s in width (Column 1). For each wind speed bin, instantaneous wind turbine power (W, Column 2)) is multiplied by the Weibull wind speed probability (f, Column 3). This cross product (Net W, Column 4) is the contribution to average turbine power output contributed by wind speeds in that bin. The sum of these contributions is the average power output of the turbine on a continuous, 24 hour, basis. Best results are achieved using annual or monthly average wind speeds. Use of daily or hourly average speeds is not recommended.

WindCad Turbine Performance Model

BWC EXCEL-S, Grid - Intertie

Tier/neo-SH3055-23-BWC

Prepared For: **Borough of Westwood**

Site Location: **DPW Grounds**

Data Source: **NASA**

Date: **3/31/2010**

10 kW

Inputs:

Ave. Wind (m/s) = 5.52
Weibull K = 2
Site Altitude (m) = 72
Wind Shear Exp. = 0.180
Anem. Height (m) = 30
Tower Height (m) = 30
Turbulence Factor = 5.0%

Results:

Hub Average Wind Speed (m/s) = 5.52
Air Density Factor = -1%
Average Output Power (kW) = 1.85
Daily Energy Output (kWh) = 44.4
Annual Energy Output (kWh) = **16,194**
Monthly Energy Output = 1,350
Percent Operating Time = 72.8%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	5.07%	0.000
2	0.00	9.37%	0.000
3	0.13	12.34%	0.016
4	0.41	13.72%	0.056
5	0.83	13.57%	0.113
6	1.43	12.24%	0.174
7	2.22	10.18%	0.226
8	3.24	7.88%	0.255
9	4.53	5.70%	0.258
10	6.06	3.86%	0.234
11	7.75	2.46%	0.191
12	9.46	1.48%	0.140
13	10.73	0.84%	0.090
14	11.10	0.45%	0.049
15	11.38	0.22%	0.026
16	11.46	0.11%	0.012
17	11.47	0.05%	0.006
18	11.42	0.02%	0.002
19	11.25	0.01%	0.001
20	10.80	0.00%	0.000
Totals:		99.56%	1.849

Weibull Calculations:

Wind speed probability is calculated as a Weibull curve defined by the average wind speed and a shape factor, K. To facilitate piece-wise integration, the wind speed range is broken down into "bins" of 1 m/s in width (Column 1). For each wind speed bin, instantaneous wind turbine power (W, Column 2)) is multiplied by the Weibull wind speed probability (f, Column 3). This cross product (Net W, Column 4) is the contribution to average turbine power output contributed by wind speeds in that bin. The sum of these contributions is the average power output of the turbine on a continuous, 24 hour, basis.

Best results are achieved using annual or monthly average wind speeds. Use of daily or hourly average speeds is not recommended.

WindCad Turbine Performance Model

BWC EXCEL-S, Grid - Intertie

Tier/neo-SH3055-23-BWC

Prepared For: **Borough of Westwood**

Site Location: **DPW Grounds**

Data Source: **NASA**

Date: **3/31/2010**

10 kW

Inputs:

Ave. Wind (m/s) = 3.81
Weibull K = 2
Site Altitude (m) = 72
Wind Shear Exp. = 0.180
Anem. Height (m) = 30
Tower Height (m) = 30
Turbulence Factor = 5.0%

Results:

Hub Average Wind Speed (m/s) = 3.81
Air Density Factor = -1%
Average Output Power (kW) = 0.65
Daily Energy Output (kWh) = 15.6
Annual Energy Output (kWh) = **5,705**
Monthly Energy Output = 475
Percent Operating Time = 51.2%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	10.33%	0.000
2	0.00	17.55%	0.000
3	0.13	20.04%	0.026
4	0.41	18.23%	0.074
5	0.83	13.95%	0.116
6	1.43	9.18%	0.131
7	2.22	5.27%	0.117
8	3.24	2.66%	0.086
9	4.53	1.18%	0.054
10	6.06	0.47%	0.028
11	7.75	0.16%	0.013
12	9.46	0.05%	0.005
13	10.73	0.01%	0.002
14	11.10	0.00%	0.000
15	11.38	0.00%	0.000
16	11.46	0.00%	0.000
17	11.47	0.00%	0.000
18	11.42	0.00%	0.000
19	11.25	0.00%	0.000
20	10.80	0.00%	0.000
Totals:		99.09%	0.651

Weibull Calculations:

Wind speed probability is calculated as a Weibull curve defined by the average wind speed and a shape factor, K. To facilitate piece-wise integration, the wind speed range is broken down into "bins" of 1 m/s in width (Column 1). For each wind speed bin, instantaneous wind turbine power (W, Column 2)) is multiplied by the Weibull wind speed probability (f, Column 3). This cross product (Net W, Column 4) is the contribution to average turbine power output contributed by wind speeds in that bin. The sum of these contributions is the average power output of the turbine on a continuous, 24 hour, basis.

Best results are achieved using annual or monthly average wind speeds. Use of daily or hourly average speeds is not recommended.

APPENDIX K

WIND ENERGY FINANCING WORKSHEET

Borough of Westwood
(Average Site Wind Speed @30m - 10.56 mph)

Annual kWh 10,651
Engineer's Opinion of Probable Cost \$68,489.69

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs \$0.02/kWh Production
REC Factor \$25/MWh Production
REIP Incentive \$3.20/kWh First 16,000 kWh
\$0.50/kWh 16,000 kWh - 750,000 kWh

Year	Utility Price	Annual Wind kWh Production	Utility Savings	Renewable Energy Credits (RECs)	Renewable Energy Incentive Program (REIP)	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow
1	0.1483	10,651.0	\$1,579.5	\$266	\$34,083	(\$213)	\$1,632.8	\$1,632.8
2	0.1527	10,597.7	\$1,618.8	\$265	\$0	(\$212)	\$1,671.8	\$3,304.6
3	0.1573	10,544.8	\$1,659.0	\$264	\$0	(\$211)	\$1,711.7	\$5,016.3
4	0.1621	10,492.0	\$1,700.2	\$262	\$0	(\$210)	\$1,752.7	\$6,769.0
5	0.1669	10,439.6	\$1,742.5	\$261	\$0	(\$209)	\$1,794.7	\$8,563.7
6	0.1719	10,387.4	\$1,785.8	\$260	\$0	(\$208)	\$1,837.7	\$10,401.5
7	0.1771	10,335.4	\$1,830.2	\$258	\$0	(\$207)	\$1,881.9	\$12,283.3
8	0.1824	10,283.8	\$1,875.7	\$257	\$0	(\$206)	\$1,927.1	\$14,210.4
9	0.1879	10,232.3	\$1,922.3	\$256	\$0	(\$205)	\$1,973.4	\$16,183.8
10	0.1935	10,181.2	\$1,970.0	\$255	\$0	(\$204)	\$2,020.9	\$18,204.8
11	0.1993	10,130.3	\$2,019.0	\$253	\$0	(\$203)	\$2,069.6	\$20,274.4
12	0.2053	10,079.6	\$2,069.2	\$252	\$0	(\$202)	\$2,119.6	\$22,394.0
13	0.2114	10,029.2	\$2,120.6	\$251	\$0	(\$201)	\$2,170.7	\$24,564.7
14	0.2178	9,979.1	\$2,173.3	\$249	\$0	(\$200)	\$2,223.2	\$26,787.9
15	0.2243	9,929.2	\$2,227.3	\$248	\$0	(\$199)	\$2,276.9	\$29,064.8
16	0.2310	9,879.5	\$2,282.6	\$247	\$0	(\$198)	\$2,332.0	\$31,396.8
17	0.2380	9,830.1	\$2,339.4	\$246	\$0	(\$197)	\$2,388.5	\$33,785.4
18	0.2451	9,781.0	\$2,397.5	\$245	\$0	(\$196)	\$2,446.4	\$36,231.7
19	0.2525	9,732.1	\$2,457.1	\$243	\$0	(\$195)	\$2,505.7	\$38,737.5
20	0.2600	9,683.4	\$2,518.1	\$242	\$0	(\$194)	\$2,566.5	\$41,304.0
21	0.2678	9,635.0	\$2,580.7	\$241	\$0	(\$193)	\$2,628.9	\$43,932.9
22	0.2759	9,586.8	\$2,644.8	\$240	\$0	(\$192)	\$2,692.8	\$46,625.7
23	0.2842	9,538.9	\$2,710.6	\$238	\$0	(\$191)	\$2,758.2	\$49,383.9
24	0.2927	9,491.2	\$2,777.9	\$237	\$0	(\$190)	\$2,825.4	\$52,209.3
25	0.3015	9,443.7	\$2,846.9	\$236	\$0	(\$189)	\$2,894.2	\$55,103.4

Borough of Westwood
(Maximum Average Site Wind Speed @30m - 12.35 mph)

Annual kWh 16,194
Engineer's Opinion of Probable Cost \$68,489.69

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs \$0.02/kWh Production
REC Factor \$25/MWh Production
REIP Incentive \$3.20/kWh First 16,000 kWh
\$0.50/kWh 16,000 kWh - 750,000 kWh

Year	Utility Price	Annual Wind kWh Production	Utility Savings	Renewable Energy Credits (RECs)	Renewable Energy Incentive Program (REIP)	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow
1	0.1483	16,194.0	\$2,401.6	\$405	\$51,297	(\$324)	\$2,482.5	\$2,482.5
2	0.1527	16,113.0	\$2,461.2	\$403	\$0	(\$322)	\$2,541.8	\$5,024.4
3	0.1573	16,032.5	\$2,522.4	\$401	\$0	(\$321)	\$2,602.6	\$7,626.9
4	0.1621	15,952.3	\$2,585.1	\$399	\$0	(\$319)	\$2,664.9	\$10,291.8
5	0.1669	15,872.5	\$2,649.3	\$397	\$0	(\$317)	\$2,728.7	\$13,020.5
6	0.1719	15,793.2	\$2,715.2	\$395	\$0	(\$316)	\$2,794.1	\$15,814.6
7	0.1771	15,714.2	\$2,782.6	\$393	\$0	(\$314)	\$2,861.2	\$18,675.8
8	0.1824	15,635.6	\$2,851.8	\$391	\$0	(\$313)	\$2,930.0	\$21,605.8
9	0.1879	15,557.5	\$2,922.7	\$389	\$0	(\$311)	\$3,000.4	\$24,606.2
10	0.1935	15,479.7	\$2,995.3	\$387	\$0	(\$310)	\$3,072.7	\$27,678.9
11	0.1993	15,402.3	\$3,069.7	\$385	\$0	(\$308)	\$3,146.7	\$30,825.6
12	0.2053	15,325.3	\$3,146.0	\$383	\$0	(\$307)	\$3,222.6	\$34,048.3
13	0.2114	15,248.6	\$3,224.2	\$381	\$0	(\$305)	\$3,300.4	\$37,348.7
14	0.2178	15,172.4	\$3,304.3	\$379	\$0	(\$303)	\$3,380.2	\$40,728.9
15	0.2243	15,096.5	\$3,386.4	\$377	\$0	(\$302)	\$3,461.9	\$44,190.7
16	0.2310	15,021.1	\$3,470.6	\$376	\$0	(\$300)	\$3,545.7	\$47,736.4
17	0.2380	14,945.9	\$3,556.8	\$374	\$0	(\$299)	\$3,631.5	\$51,367.9
18	0.2451	14,871.2	\$3,645.2	\$372	\$0	(\$297)	\$3,719.5	\$55,087.5
19	0.2525	14,796.9	\$3,735.8	\$370	\$0	(\$296)	\$3,809.8	\$58,897.3
20	0.2600	14,722.9	\$3,828.6	\$368	\$0	(\$294)	\$3,902.2	\$62,799.5
21	0.2678	14,649.3	\$3,923.8	\$366	\$0	(\$293)	\$3,997.0	\$66,796.5
22	0.2759	14,576.0	\$4,021.3	\$364	\$0	(\$292)	\$4,094.1	\$70,890.6
23	0.2842	14,503.1	\$4,121.2	\$363	\$0	(\$290)	\$4,193.7	\$75,084.3
24	0.2927	14,430.6	\$4,223.6	\$361	\$0	(\$289)	\$4,295.7	\$79,380.1
25	0.3015	14,358.5	\$4,328.6	\$359	\$0	(\$287)	\$4,400.3	\$83,780.4

Borough of Westwood
(Minimum Average Site Wind Speed @30m – 8.52 mph)

Annual kWh 5,705
Engineer's Opinion of Probable Cost \$68,489.69

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs \$0.02/kWh Production
REC Factor \$25/MWh Production
REIP Incentive \$3.20/kWh First 16,000 kWh
\$0.50/kWh 16,000 kWh - 750,000 kWh

Year	Utility Price	Annual Wind kWh Production	Utility Savings	Renewable Energy Credits (RECs)	Renewable Energy Incentive Program (REIP)	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow
1	0.1483	5,705.0	\$846.1	\$143	\$18,256	(\$114)	\$874.6	\$874.6
2	0.1527	5,676.5	\$867.1	\$142	\$0	(\$114)	\$895.5	\$1,770.0
3	0.1573	5,648.1	\$888.6	\$141	\$0	(\$113)	\$916.9	\$2,686.9
4	0.1621	5,619.9	\$910.7	\$140	\$0	(\$112)	\$938.8	\$3,625.7
5	0.1669	5,591.8	\$933.3	\$140	\$0	(\$112)	\$961.3	\$4,587.0
6	0.1719	5,563.8	\$956.5	\$139	\$0	(\$111)	\$984.3	\$5,571.3
7	0.1771	5,536.0	\$980.3	\$138	\$0	(\$111)	\$1,008.0	\$6,579.3
8	0.1824	5,508.3	\$1,004.7	\$138	\$0	(\$110)	\$1,032.2	\$7,611.5
9	0.1879	5,480.8	\$1,029.6	\$137	\$0	(\$110)	\$1,057.0	\$8,668.6
10	0.1935	5,453.4	\$1,055.2	\$136	\$0	(\$109)	\$1,082.5	\$9,751.0
11	0.1993	5,426.1	\$1,081.4	\$136	\$0	(\$109)	\$1,108.6	\$10,859.6
12	0.2053	5,399.0	\$1,108.3	\$135	\$0	(\$108)	\$1,135.3	\$11,994.9
13	0.2114	5,372.0	\$1,135.8	\$134	\$0	(\$107)	\$1,162.7	\$13,157.6
14	0.2178	5,345.1	\$1,164.1	\$134	\$0	(\$107)	\$1,190.8	\$14,348.4
15	0.2243	5,318.4	\$1,193.0	\$133	\$0	(\$106)	\$1,219.6	\$15,568.0
16	0.2310	5,291.8	\$1,222.6	\$132	\$0	(\$106)	\$1,249.1	\$16,817.1
17	0.2380	5,265.3	\$1,253.0	\$132	\$0	(\$105)	\$1,279.4	\$18,096.5
18	0.2451	5,239.0	\$1,284.2	\$131	\$0	(\$105)	\$1,310.4	\$19,406.8
19	0.2525	5,212.8	\$1,316.1	\$130	\$0	(\$104)	\$1,342.1	\$20,749.0
20	0.2600	5,186.7	\$1,348.8	\$130	\$0	(\$104)	\$1,374.7	\$22,123.7
21	0.2678	5,160.8	\$1,382.3	\$129	\$0	(\$103)	\$1,408.1	\$23,531.8
22	0.2759	5,135.0	\$1,416.7	\$128	\$0	(\$103)	\$1,442.3	\$24,974.1
23	0.2842	5,109.3	\$1,451.9	\$128	\$0	(\$102)	\$1,477.4	\$26,451.5
24	0.2927	5,083.8	\$1,487.9	\$127	\$0	(\$102)	\$1,513.4	\$27,964.9
25	0.3015	5,058.4	\$1,524.9	\$126	\$0	(\$101)	\$1,550.2	\$29,515.1

APPENDIX L

GLACIAL ENERGY – ALTERNATIVE ELECTRIC SUPPLIER QUOTE

Savings Analysis Proposal - PSE&G

Glacial Energy



This analysis illustrates what your recent energy costs savings might have been had Glacial Energy been your preferred electricity supplier. This proposal is based on your organization's estimated usage (kwh) and demand (kw) over the coming year.

Secure your savings today!

Contract Summary - Forecasted Price Comparison

Company Name: Westwood Free Public Library
Billing Address: 49 Park Ave., Westwood, NJ 07675

Start Month: May-10
Number of LDC Accounts: 1
Retail Margin Adder: N/A

Estimated Rate over the next 12 months

Avg Rate (\$/kwh)*: \$ 0.13035
Annual Utility Charges: \$ 16,682

Glacial Energy Index: \$ 0.10882
Glacial Charges: \$ 13,926

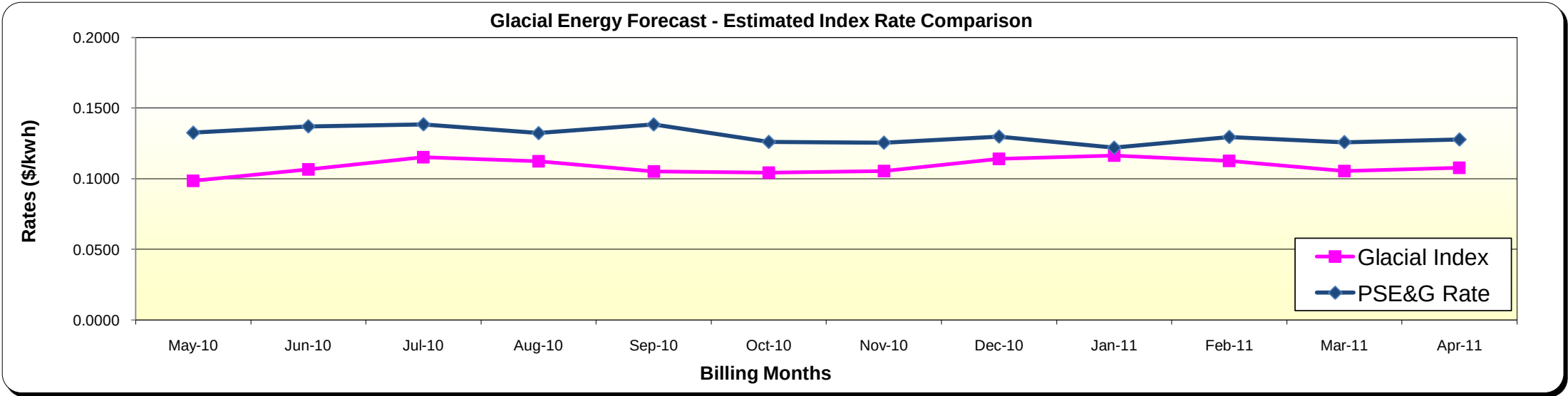
Forecasted Customer Usage Data Summary

Usage (kwh): 127,979
Avg Monthly Usage (kwh): 10,665
Peak Monthly kw: 62
Peak Load Factor: 24%
Capacity PLC: 55
Transmission PLC: 48

Savings Summary

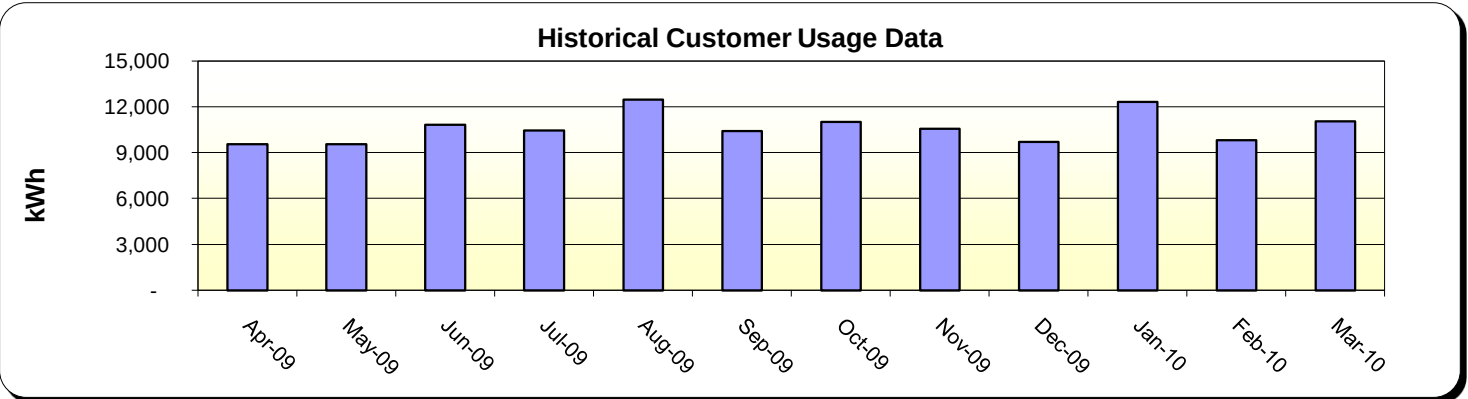
Estimated Savings vs. Utility \$ 2,755
Savings (Glacial vs. Utility) 17%

The savings in this proposal are estimated, not guaranteed. Actual savings may vary.



- Glacial Index Includes:
- a. Wholesale Delivery Price of Energy
 - b. Energy Losses and Unaccounted for Energy (UFE)
 - c. Ancillary Services & other ISO Charges
 - d. Zonal Congestion
 - e. Retail Adder
 - f. Transmission Losses & Charges
 - g. Capacity Charges
 - h. NJ SUT (Tariff Rate also includes NJ SUT)

- Glacial Index Excludes:
- a. Distribution or other (wires) charges from the utility
 - b. Non NJ SUT Taxes.



LDC Account No: PE000009302482616071
Physical Address: 49 Park Ave., Westwood, NJ 07675

1. The Glacial Index price is a monthly variable rate, it is not a fixed rate.
2. The index is based in part on forecasted ISO charges, estimated future zonal energy prices and the cost to provide service.
3. The forward tariff rates are based on the latest, pending or estimated utility rates (inclusive of NJ SUT), as published by the utility or forecasted for this rate schedule.

Savings Analysis Proposal - PSE&G

Glacial Energy



This analysis illustrates what your recent energy costs savings might have been had Glacial Energy been your preferred electricity supplier.

Contract Summary - Historical Utility Charges

Company Name: Westwood Free Public Library
Billing Address: 49 Park Ave., Westwood, NJ 07675

Historical Timeframe (mo.): 6
Start Month: Oct-09
Number of LDC Accounts: 1

Estimated Historical Utility Charges

Avg Rate (\$/kwh): \$ 0.12320
Annual Utility Charges: \$ 7,941

Historical Glacial Index: \$ 0.10520
Historical Glacial Charges: \$ 6,780

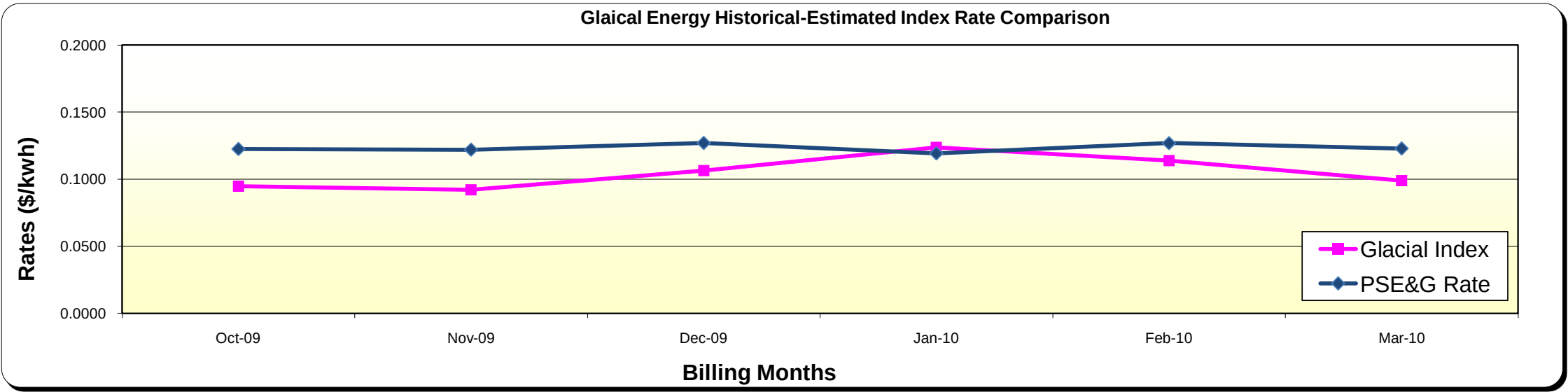
6 month Period Summary

Usage (kwh): 64,456
Avg Monthly Usage (kwh): 10,743
Peak Monthly kw: 62
Peak Load Factor: 24%
Capacity PLC: 55
Transmission PLC: 48

Savings Summary

Historical Savings vs. Utility \$ 1,161
Historical Savings (Glacial vs. Utility) 15%

The savings in this proposal are estimated, not guaranteed. Actual savings will vary.



- Glacial Index Includes:**
- a. Wholesale Delivery Price of Energy
 - b. Energy Losses and Unaccounted for Energy (UFE)
 - c. Ancillary Services & other ISO Charges
 - d. Zonal Congestion
 - e. Retail Adder
 - f. Transmission Losses & Charges
 - g. Capacity Charges
 - h. NJ SUT (Tariff Rate also includes NJ SUT)

- Glacial Index Excludes:**
- a. Distribution or other (wires) charges from the utility
 - b. Non NJ SUT Taxes.

1. The historic tariff rate comparison is based on the customer's historical usage as provided or estimated and provided or estimated demand over the previous term.
2. Savings are based on the corresponding utility rates for the appropriate rate schedule over the analysis term.

APPENDIX M

WATER FIXTURE INVENTORY

Borough of Westwood Water Fixtures										
Building	Occupants	Fixture Type	Quantity	Existing Water Use (gpm or gallons per flush)	Estimated Existing Monthly Water Use (gallons)*	Low-Flo Fixture Water Use (gpm or gallons per flush)	Estimate Future Monthly Water Use (gallons)	Current Annual Cost	Future Annual Cost	Annual Savings
Borough Hall	51	Faucets	13	3	2295	1.5	1147.5	\$767	\$283	\$484
		Toilets	11	3.5	10710	1.3	3978			
		Urinals	8	2	1530	0.5	240			
Public Library	7	Faucets	5	3	315	1.5	157.5	\$94	\$37	\$57
		Toilets	5	3.5	1470	1.3	546			
		Urinals	0	2	0	0.5	0			
DPW Garages	11	Faucets	7	3	495	1.5	247.5	\$148	\$58	\$90
		Toilets	6	3.5	2310	1.3	858			
		Urinals	0	2	0	0.5	0			
Fire Department	1	Faucets	16	3	45	1.5	22.5	\$13	\$5	\$8
		Toilets	11	3.5	210	1.3	78			
		Urinals	0	2	0	0.5	0			

Assumed Water Cost (Local United Water
Rate, Per 1,000 Gallons): \$4.3967

*Includes the assumption that occupants utilize toilets 2 times per day, and that half the occupants utilize urinals 2 times per day. Additionally, occupants are assumed to use faucets for 15 second durations, twice per day. These assumptions are considered conservative.