CDM

Final Energy Audit Report

Glassboro Public Schools
July 9, 2010

Contents

Executive Summary

As part of an initiative to reduce energy cost and consumption, the Glassboro Board of Education has secured the services of Camp Dresser and McKee (CDM) to perform an energy audit for eight (8) buildings which are owned and operated by the School District in an effort to develop comprehensive Energy Conservation and Retrofit Measures (ECRMs).

CDM's energy audit team visited the schools on March 3 and 4, 2010. As a result of the site visits 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 District's buildings to offset the electrical energy usage. Specifically, the use of solar electric photovoltaic panels, ground source heat pumps and wind turbines were investigated.

Additionally, there is potential for the District 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 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 are recommended.

The payback periods presented do not account for additional cost savings associated with participation in the Pay for Performance Program or the Direct Install Program. The eligibility requirements and associated cost savings available through participation in these Programs are discussed in Section 7.2.

Historical Energy Usage

The following table, Table ES-1, summarizes the historical energy usage at each of the buildings as presented in Section 3. 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**
Glassboro High School	1,563,504	351	327	84,089	$209,218	$99,019
Glassboro Intermediate School	956,100	399	636	69,159	$135,716	$82,071
Glassboro Intermediate School – Annex	6,530	7.9	6.9	1,991	$1,093	$2,683
Tomas E. Bowe School	941,800	240	106	50,854	$121,883	$59,257
Dorothy Bullock School	965,700	600	294	52,511	$135,975	$60,155
J. Harvey Rodgers School	365,680	148	148	25,523	$51,382	$29,175
Elsmere School	30,920	14	16	4,649	$4,949	$5,446
Beach Administration Building	136,512	1,012	231	2,747	$20,150	$3,245

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. The lighting system improvements that include upgrades to both the interior and exterior lighting systems have been recommended. Although these measures have a longer payback period than improvements to the interior lighting system alone, implementing retrofits to both the interior and exterior lighting systems results in a greater energy savings.

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. Table ES-2 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[3]	**ECRM**	**Total Cost**	**Energy Savings**	**Annual Fiscal Savings[2]**	**Simple Payback (Years)**
1	**Glassboro Intermediate School - BMS System**	$34,886	57,240 kWh 6,515 Therms	$22,296	**1.6**
2	**Glassboro Intermediate School Annex - Lighting Upgrades**	$1,059	3,516.4 kWh	$601	**1.8**
3	**Glassboro High School - BMS System**	$65,501	71,420 kWh 7,613 Therms	$20,811	**3.1**
4	**Beach Administration Building - Lighting Upgrades**	$2,637.8	2,899.9 kWh	$672	**3.9**
5	**J. Harvey Rodgers - BMS System**	$22,535	10,297 kWh 2,423 Therms	$5,002	**4.5**
6	**Glassboro High School - Lighting Upgrades**	$55,172	60,884.7 kWh	$8,178	**6.7**
7	**Glassboro High School - Boiler Upgrade**	$193,718	17,604 Therms	$26,322	**7.4**
8	**Dorothy Bullock School - Lighting Upgrades**	$44,336	38,437.6 kWh	$5,927	**7.5**
9	**Glassboro Intermediate School – Boiler Upgrade**	$233,670	20,524 Therms	$29,644	**7.9**
10	**Thomas E. Bowe School - Lighting Upgrades**	$69,182	60,818.7 kWh	$8,675	**8.0**
11	**J. Harvey Rodgers School - Lighting Upgrades**	$21,835	15,116.8 kWh	$2,538	**8.6**
12	**Dorothy Bullock School – Boiler Upgrade**	$177,563	13,513 Therms	$20,013	**8.9**
13	**Elsmere School - Lighting Upgrades**	$7,032	2,446.7 kWh	$446	**15.8**
14	**Glassboro Intermediate School - Lighting Upgrades**	$12,510	4,121 kWh	$699	**17.9**
15	**Elsmere School – Boiler Upgrade**	$42,283	1,155 Therms	$2,129	**19.9**

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.
3. Overall Ranking is based on the simple payback period.

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 School District's facilities. The evaluation covered the economic feasibility of the School District 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 School District to further investigate the installation of a solar energy system at six (6) of the School District buildings. This is primarily based on the initial upfront capital investment required for a solar energy system installation and the 11.5 year combined 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 15 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 six (6) School District buildings.

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

Estimated Budgetary Project Cost	$23,105,260
1st Year Production	2,455,236 kWh
Annual Electric Savings	$353,313
Annual Estimated SREC Revenue	$1,659,046
Project Simple Payback	**11.5 Years**

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 at eight (8) of the Glassboro School District buildings. 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, 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 at several of the Glassboro School District facilities. Refer to Appendix K for a more detailed wind energy financing spreadsheet.

Table ES-4: Simple Payback Analysis for Wind Turbine Energy System

Parameter	Wind Turbine (Minimum Site Wind Speed – 8.7 mph)	Wind Turbine (Maximum Site Wind Speed – 12.7 mph)	Wind Turbine (Average Site Wind Speed – 11.0 mph)
Engineer's Opinion of Probable Cost	$21,875	$21,875	$21,875
Renewable Energy Incentive Program**	-$11,104	-$21,875	-$19,648
Total Cost	$10,771	$0	$2,227
1st Year Production	3,470 kWh	7,970 kWh	6,140 kWh
Annual Estimated Electric Savings	$584.7	$1,342.9	$1034.6
Annual Estimated REC Revenue	$87	$199	$154
Project Simple Payback	**16.0 Years**	**0 Years**	**1.9 Years**
Annual Return On Investment (AROI)	2.23%	NA	49.4%
Lifetime Energy Savings (25 years)**	$21,660.1	$49,747.4	$38,326.5
Internal Rate of Return (IRR)	5.79%	NA	55.5%
Net Present Value (NPV)	$4,035.1	$34,007.1	$23,971.7

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

Computer Power Management Software

Section 4.3.3 of the report provides for an economic evaluation of computer power management software recommended to be installed at six (6) of the Glassboro School District facilities.

Table ES-5 includes a typical simple payback analysis for the installation of the computer power management software at six (6) of the Glassboro School District facilities. Refer to Appendix L for a more detailed computer power management software financing spreadsheet.

Table ES-5: Ranking of Energy Savings Measures Summary – Computer Power Management Software				
Site	**Engineers Opinion of Probable Cost**	**Annual Energy Savings**	**Lifetime Energy Savings (5 Years)**	**Simple Payback (Years)**
Dorothy Bullock School	$1,159.2	$2,019.2	$10,720.2	**0.57**
J. Harvey Rodgers School	$956.8	$1,666.6	$8,848.2	**0.57**
Beach Administration Building	$239.2	$416.7	$2,212.3	**0.57**
Glassboro Intermediate School	$1,232.8	$2,004.2	$10,640.6	**0.62**
Thomas E. Bowe School	$1,913.6	$3,111.1	$16,517.3	**0.62**
Glassboro High School	$2,410.4	$3,638.8	$19,318.9	**0.66**

Recommended ECRMs

Table ES-6 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-6: Recommended ECRM's[1]			
Total Engineer's Opinion of Probable Construction Cost	**Projected Annual Energy Savings (kWH, therms, or gal oil)**	**Projected Annual Fiscal Savings**	**Simple Payback Period (years)**
$2,120,641	238,935 kWh 14,595 therms 33,877 gal oil	$277,740	9.7

1. 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 Glassboro Board of Education has secured the services of Camp Dresser and McKee (CDM) to perform an energy audit at eight (8) of the District's buildings 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.

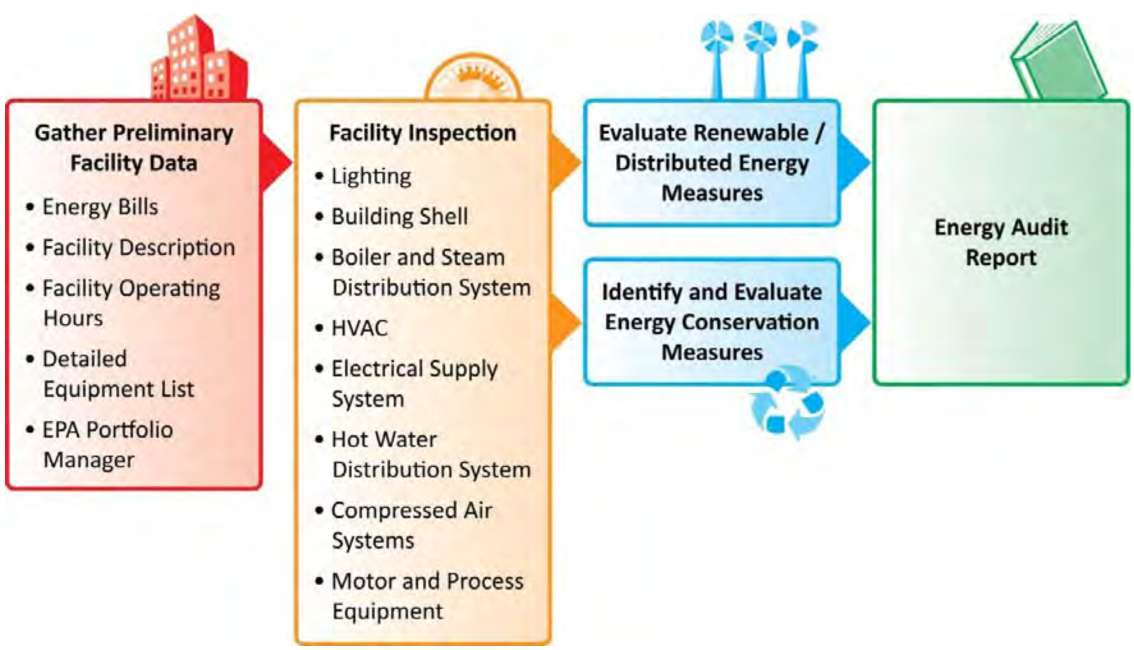


Figure 1-1: Energy Audit Phases

1.2 Background

The buildings that were included in the energy audit for the Glassboro Board of Education were the Glassboro High School, Glassboro Intermediate School and Annex, the Thomas E. Bowe School, the Dorothy Bullock School, the J. Harvey Rodgers School, the Elsmere School and the Beach Administration Building.

The Glassboro High School is an 113,915 ft^2 building that was built in 1966. The science wing and extension to the cafeteria were completed in 2004. The high school consists of office space, classrooms, gym and locker rooms, auditorium space and a nurse's office. The school is occupied by 635 students and 85 faculty and staff members. The school is occupied from 7 am to 8 pm during the week and is partially occupied on Saturdays and Sundays for basketball practice.

The Glassboro Intermediate School is a 60,671 ft^2 building that was originally built in 1929, with replacement of the original steam heat system and renovation of the media center and gym completed in 2003. The intermediate school consists of office space, class rooms, gym and locker rooms, auditorium space and a nurse's office. The school is occupied by 313 students and 58 faculty and staff members. The school is occupied from 7 am to 8 pm during the week and is partially occupied on Saturdays.

The Glassboro Intermediate School Annex is a 6,270 ft^2 building that was originally built in 1951. The Annex consists of four classrooms, office space and bathrooms. The Annex is used by Intermediate School students for certain extracurricular classes throughout the school day.

The Thomas E. Bowe School is a 75,514 ft^2 building that was originally built in 1972, with renovation of the interior space and the replacement of all multi-zone roof top units completed in 2002. The School was originally an open floor plan that was renovated to provide separate classroom space in 2002. The Bowe School is utilized for 4^{th}, 5^{th} and 6^{th} grade classes. The middle school consists of office space, class rooms, gym, auditorium space and a nurse's office. The school is occupied by 527 students and 65 faculty and staff members. The school is occupied from 7 am to 8 pm during the week.

The Dorothy Bullock School is an 87,700 ft^2 building that was built in 1993. The school is utilized for 1^{st}, 2^{nd} and 3^{rd} grade classes and consists of office space, class rooms, gym, auditorium space and a nurse's office. The school is occupied by 490 students and 79 faculty and staff members. The school is occupied from 7 am to 8 pm during the week.

The J. Harvey Rodgers School is a 39,192 ft^2 building that was originally built in 1957, with an extension to essentially double the building footprint completed in 2000. The school is utilized for pre-K and kindergarten classes and consists of office space, classrooms, gym, auditorium space and a nurse's office. The school is occupied by 333 students and 50 faculty and staff members. The school is occupied from 7 am to 8 pm during the week.

The Elsmere School is a 5,358 ft^2 building that was originally built in 1927. The school is utilized for after school services. There are two full-time employees. The school is occupied from 8 am to 8 pm during the week.

The Beach Administration Building is a 6,530 ft^2 building that was built in 1986. The building consists of office space, conference rooms and a small kitchenette. The building is occupied by 15 District employees from 8 am to 8 pm during the week.

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 buildings' envelopes, 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 and thermal energy and are clear candidates for energy savings measures. In addition, potential energy generation 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, the potential for energy cost savings through participation in a Demand Response Program is discussed in Section 5.

Section 2
Facility Description

2.1 Beach Administration Building

2.1.1 Description of Building Envelope

The walls of the Administration Building are concrete cavity walls consisting of brick façade, cavity and finished interior. The roofing system consists of insulation and EPDM membrane on a flat roof deck. The windows throughout the building are double pane windows with aluminum frames and the exterior doors are light weight steel.

It was determined that the building envelope is in good condition and is currently providing a high level of insulation. As such, any 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

Heat is provided to the administration building by two Sterling Furnaces. These two furnaces are located in either the mechanical closet or the server room closet.

The office is cooled by two condensing units located outside. The server room has two Sea Breeze portable air conditioning units providing cooling to the room. A Sanyo wall mounted air conditioning unit provides additional cooling to the server room. An inventory of noted HVAC equipment and service locations may be found in Section 4.

2.1.3 Description of Building Lighting

The Beach Administration Building's existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2, 3, 4 lamp) T8 linear fluorescent fixtures with electronic ballasts, 1X4 (1 lamp) T12 linear fluorescent fixtures with magnetic ballast, metal halide fixtures, incandescent fixtures, and CFL fixtures. See Section 4 for a more detailed description.

2.2 Dorothy Bullock School

2.2.1 Description of Building Envelope

The walls of the Dorothy Bullock School are concrete cavity walls consisting of brick façade, cavity, and CMU backup blocks. The roofing system consists of metal seam or sections of built-up roofing. CDM was advised that the metal seam roof leaks.

Unfortunately, evidence of leaking seams on metal roofs may show up several feet away, as the water will not always travel straight down. It can follow the truss system, seep down the sidewalls, or pool up until it finds an outlet. Metal roofs can be installed in a number of ways, but typically they have an overlap with a gasket. The leaks may be the cause of bad gaskets, in combination with the expansion and contraction of the metal roofs. Further evaluation of the roof is required to identify the

location and cause of the leak. This can lead to replacement or spot replacement. Due to the expansion and contraction of the roofing system, it is not recommended that a particular seam be sealed.

Pooling of storm water at the concrete slab was noted. The slope of the grade does not permit drainage of the storm water away from the building. It was noted that several of the other roof drains were extended away from the building to minimize this effect and the potential for water damage. It is recommended that this be applied to all the roof drains or that the grade is built-up to allow for the storm water to run away from the building slab.

The windows throughout the building are double pane, double hung windows with aluminum frames, and the exterior doors are light weight steel.

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

2.2.2 Description of Building HVAC

A hot water system provides the heating at the Dorothy Bullock School. Two Weil McLain boilers, with input ratings of 2,396 MBH each, generate the hot water. The hot water system serves individual Snyder General unit ventilators within the classrooms, as well as the air handling units. A Sterling hot water unit heater serves the receiving room. The gymnasium and cafeteria each have six large convectors that provide heat to the space. Six large cabin fans are located in both the cafeteria and gym which are used to dry the floors. A make-up air unit located on the roof services the kitchen.

A Trane air cooled liquid chiller located outside coupled with an ice storage system provides chilled water to cooling coils in air handling units located throughout the school. It should be noted that the ice storage tanks are located outside and that the chiller creates ice at night. Three Brown condensers are located on the roof for the kitchen and freezers. An inventory of noted HVAC equipment and service locations may be found in Section 4.

2.2.3 Description of Building Lighting

The Dorothy Bullock School existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2, 3 lamp) T8 linear fluorescent fixtures with electronic ballasts, metal halide fixtures, incandescent fixtures, and CFL fixtures. See Section 4 for a more detailed description.

2.3 Elsmere School

2.3.1 Description of Building Envelope

The walls of the Elsmere School are of concrete construction with finished interior. The roof is pitched with asphalt shingles. The windows throughout the building are double pane. However, it was observed that the double windows have failed with evidence of moisture between the panes, minimizing the positive thermal effect of the two panes.

CDM is aware of the vandalism problems in the area of the Elsmere School. As the existing double pane windows are no longer providing the intended thermal insulation, to protect the recommended investment of new windows, consideration may be given to the installation of new double or single pane windows with plexiglass exterior storms.

It was determined that the building envelope is in good condition and is currently providing a good level of insulation. As such, any 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

A hot water system provides the heating at the Elsmere School. One Weil McLain cast iron boiler, with a gross I=B=R output rating of 364 MBH, is located in the boiler room. The hot water system serves individual unit ventilators and fin tube radiators within the classrooms.

Window air conditioning units were noted on Northeast and Southeast classrooms. The Northwest and Southwest classrooms are cooled by two (2) McQuay condensing units. HVAC equipment and service locations may be found in Section 4.

2.3.3 Description of Building Lighting

The Elsmere School existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2, 3 lamp) T8 linear fluorescent fixtures with electronic ballasts, metal halide fixtures, incandescent fixtures, and CFL fixtures. See Section 4 for a more detailed description.

2.4 Glassboro High School

2.4.1 Description of Building Envelope

The energy audit included an evaluation of the building envelope (exterior shell) to determine the components' effective R-values to be utilized in the building model and to identify 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 Glassboro High School is slab on grade construction, with concrete cavity walls consisting of brick façade, cavity and CMU backup blocks. The roof of the 2003 additions, which includes the science wing and the cafeteria, and approximately 50% of the original high school building, is a BUR system consisting of 2" of isocyanurate insulation and multiple layers of roof felts with hot applied bitumen between the roofing layers and a gravel top. This roof is in good condition. The roof on the remainder of the building, particularly the C-Wing, is a ballasted EPDM membrane roofing system that is original to the building. Not only did facility staff indicate that this portion of the roof is known to leak, but the interior drop ceiling was stained in sections of the C-Wing.

It is recommended to completely tear-off the remainder of the original roofing system of the C-Wing including membranes, flashings, insulation, etc., down to the base substrate. An isocyanurate insulation system is recommended to promote positive drainage to existing roof drains. Installation of 1/2-in thick, high-density wood fiber recovery board insulation is also recommended. It is recommended to install a new modified asphalt 3-ply built-up system with polyester felts and white or cool colored granulated cap sheet or a modified bitumen hot or cold applied system; including a 20 year warranty. Built-up or modified bitumen systems permit maximum movement of the membrane and flashing, without failure, due to its elasticity. In addition, the roofing system would then be consistent throughout the building.

It is recommended that a qualified roofing contractor evaluate the system, including the structural capacity of the building frame. Due to the cost of a roof replacement, it is anticipated that the payback will be in excess of 20 years; as such this recommendation has not been evaluated further.

The windows throughout the building are double pane with aluminum frames and the exterior doors are light weight steel. The windows and doors were recently installed in 1997. It was noted that the weather-stripping on the exterior doors was worn. As such, the installation of new weather-stripping and flexible door sweeps are recommended. This will work to reduce infiltration of ambient, unconditioned air and improve occupant comfort, resulting in a noticeable energy cost savings.

2.4.2 Description of Building HVAC

A hot water system provides the heating at Glassboro High School. Two Cleaver-Brooks boilers, with input ratings of 5,230 MBH each, generate the hot water. The hot water system serves individual unit ventilators within the classrooms, as well as the air handling units. Rooftop units provide heat to the auxiliary gym.

A Trane liquid chiller, located in the boiler room, serves chilled water coils in air handling units throughout the school (except the C wing). The rooftop unit that serves the new science wing has variable air volume terminals that provide heating and cooling. A Trane heating and cooling rooftop unit serve part of the C wing. Two Trane rooftop air conditioners provide cooling to two rooms in the A-I wing. Three rooftop high efficiency condensing units serve other portions of the C wing. Window air conditioning units were noted during the audit to serve rooms C110, C106, C105, and 102. An inventory of noted HVAC equipment and service locations may be found in Section 4.

2.4.3 Description of Building Lighting

The Glassboro High School existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2, 3, 4 lamp) T8 linear fluorescent fixtures with electronic ballasts, metal halide fixtures, incandescent fixtures, and CFL fixtures. See Section 4 for a more detailed description.

2.5 Glassboro Intermediate School

2.5.1 Description of Building Envelope

The walls of the Glassboro Intermediate School are concrete cavity walls consisting of brick façade, cavity, and CMU backup blocks. The roofing systems consist of black EPDM membrane over flat roof decks. This roof was replaced in 1997. The windows throughout the building are tempered double pane, double hung windows with aluminum frames and the exterior doors are light weight steel. The light weight steel doors are recommended as the high strength, light weight material contains a layer of insulation and good sealing ability, as the doors will not expand or contract with changing climate. The windows and exterior doors were replaced in 1997.

It was noted that the greenhouse is constructed of single pane glass. While replacement of this single pane glass with high performance, air tight glass panels for improved energy efficiency, the cost for replacement is not expected to be justified through the energy savings alone. More cost effective options include the application of new caulking, 'shrink-to-fit' plastic films for making temporary interior windows, or the installation of storm windows. These measures are recommended as temporary solutions to minimize infiltration and improve building occupant comfort.

It was determined that the building envelope is in good condition and is currently providing a high level of insulation. As such, any 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

A hot water system provides the heating at Glassboro Intermediate School. Two Smith cast iron boilers, with input ratings of 6,341MBH each, generate the hot water. The hot water system serves individual unit ventilators within the classrooms, as well as air handling, and rooftop units. Heat recovery units supply heat to the boys and girls locker rooms. Two Trane hot water unit heaters provide heat to the boiler room. Rooftop units provide heat to the auxiliary gym.

A York air cooled chiller, located outside, serves chilled water coils in air handling units throughout the school. In addition to this, several packaged rooftop air conditioners serve areas such as the orchestra room, prep room, science labs, and gym. A window air conditioning unit serves room 211. An inventory of noted HVAC equipment and service locations may be found in Section 4.

2.5.3 Description of Building Lighting

The Glassboro Intermediate School existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2, 3, 4 lamp) T8 linear fluorescent fixtures with electronic ballasts, metal halide fixtures, incandescent fixtures, and CFL fixtures. See Section 4 for a more detailed description.

2.6 Glassboro Intermediate School Annex

2.6.1 Description of Building Envelope

The walls of the Glassboro Intermediate School Annex are concrete cavity walls consisting of brick façade, cavity, and CMU backup blocks. The roofing system consists of black EPDM membrane over flat roof decks. The windows of the Annex are tempered double pane, double hung windows with aluminum frames and the exterior doors are light weight steel.

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

2.6.2 Description of Building HVAC

A hot water system provides the heating at the Intermediate School Annex. Two Aerco cast iron boilers, with input ratings of 1,000 MBH each, are located in the boiler room. The hot water system serves unit ventilators located above the classrooms.

Cooling is provided to the Intermediate School Annex by air cooled condensing units located on the roof. CDM did not have access to the roof at the time of the audit, so equipment and service locations were taken from drawings. The inventory can be found in Section 4.

2.6.3 Description of Building Lighting

The Glassboro Intermediate School Annex's existing lighting system consists of 1X4 (2 lamp), 2X4 (2, 3 lamp) T8 linear fluorescent fixtures with electronic ballasts, metal halide fixtures, incandescent fixtures, and CFL fixtures. See Section 4 for a more detailed description.

2.7 J. Harvey Rodgers School

2.7.1 Description of Building Envelope

The walls of the J. Harvey Rodgers School are concrete cavity walls consisting of brick façade, cavity, and CMU backup blocks. The roofing system consists of insulation and EPCM membrane over flat roof deck. In general, the roof was observed to be in good condition, with minimal pooling and no signs of leakage on the interior of the building. The windows throughout the building are double pane, double hung windows with aluminum frames and the exterior doors are light weight steel.

It was noted that window air conditioning units were 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 overall building heating load will be minimal; however, there will be a direct impact on the occupants' comfort.

Example of an Outdoor AC Cover

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

2.7.2 Description of Building HVAC

A hot water system provides the heating at J. Harvey Rodgers School. Two Weil McLain cast iron boilers are located in the B-wing boiler room, with an input rating of 1,820 MBH each. These two boilers generate the hot water for the B-wing. Two Lochinvar boilers are located in the A-wing boiler room, with an input rating of 750 MBH each. The Lochinvar boilers generate hot water for the A-wing. The hot water system serves individual unit ventilators and fin tube radiators within the classrooms. The hot water is also supplied to the air handling units that are serving offices, and corridors.

Window air conditioning units were noted in the faculty and RR room, as well as rooms B-2, B-3, B-4, B-5, B-6, B-7, and B-8. Rooftop condensing units serve the offices, hallway, gym and room B-1. Ground mounted condensing units serve the ten A-wing classrooms. An inventory of noted HVAC equipment and service locations may be found in Section 4.

2.7.3 Description of Building Lighting

The J. Harvey Rodgers School existing lighting system consists of 1X4 (2 lamp), 2X2 (2 lamp), 2X4 (2, 3, 4 lamp) T8 linear fluorescent fixtures with electronic ballasts, metal halide fixtures, incandescent fixtures, and CFL fixtures. See Section 4 for a more detailed description.

2.8 Thomas E. Bowe School

2.8.1 Description of Building Envelope

The walls of the Thomas E. Bowe School are concrete cavity walls consisting of brick façade, cavity, and CMU backup blocks. The majority of the roofing system is of metal seam construction. There are also sections of BUR roofing and EPDM membrane. In general, the roof was observed to be in good condition, with minimal pooling and no signs of leakage on the interior of the building. The roof was replaced in 1997. The windows throughout the building are double pane, double hung windows with aluminum frames and the exterior doors are light weight steel. The windows and exterior doors were replaced in 1997.

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

2.8.2 Description of Building HVAC

Heating for the Thomas E. Bowe School is primarily provided by Mammoth gas-fired rooftop packaged air conditioning units. The gym, faculty dining room, and room

A107 are heated by three gas fired rooftop units. Electric unit ventilators provide additional heat to the corridor entrances. A gas fired unit heater manufactured by Trane heats the boiler room.

Cooling is provided to most of the school, by the aforementioned rooftop air conditioning units.

2.8.3 Description of Building Lighting

The Thomas E. Bowe School existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2, 3, 4 lamp) T8 linear fluorescent fixtures with electronic ballasts, metal halide fixtures, incandescent fixtures, and CFL fixtures. See Section 4 for a more detailed description.

2.9 Miscellaneous Equipment

It was noted that the School District has Energy Star appliances and copiers. It is recommended that the District continue with implementing the standardized use of Energy Star appliances as the need arises. Energy Star appliances not only reduce the District's utility bills, but also outperform standard appliances due to the improved design and advanced technologies.

In addition to replacing old appliances with Energy Star appliances, the following two maintenance procedures can work to save the energy consumed by the District's 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.

It may also be considered that the 'Vending Misers' be purchased and utilized for vending machines throughout the District's facilities. A 'Vending Miser' powers down a vending machine when the surrounding area is unoccupied and automatically repowers when the area is occupied, utilizing an infrared sensor. Similarly to occupancy sensors on lighting fixtures; however, the vending miser also monitors the ambient temperature while the vending machine is powered down and uses this as sort of an internal thermostat to power up the machine and ensure that the drinks remain cold. The implementation of a 'Vending Miser' also reduces maintenance costs and extends the life of the machine, by reducing the number of compressor cycles. A 'Vending Miser' is a $180 investment, but has been found to reduce power consumption of a cold drink vending machine by an average of 46%.

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 electric and gas 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 School District, 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 District.

3.1.1 Electric Charges

It is important to understand how the utility companies charge for the service. The majority of the energy consumed is electric, as a result of both indoor and outdoor lighting and heating, ventilating and air-conditioning equipment. 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 oil, 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. This penalty does not affect the District.

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.

Atlantic City Electric is the current distributor of electric energy for the Glassboro School District and South Jersey Energy Company is the third party supplier of electricity.

3.1.2 Natural Gas Charges

South Jersey Energy and Pepco are the current distributors and suppliers of natural gas for the school facilities. The school facilities are 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 Beach Administration Building

Electric power for the Beach Administration Building is fed from five General Secondary Service 3-phase lines from Atlantic City Electric. Figure 3.2-1 illustrates the average monthly total energy consumption from December 2007 through December 2009. For example, for the month of October, the bar graph represents average energy consumption for October 2008 and October 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 average annual electrical consumption for the Beach Administration Building is approximately 12,800 kWh / month.

Figure 3.2-1: Beach Administration Building Electrical Usage

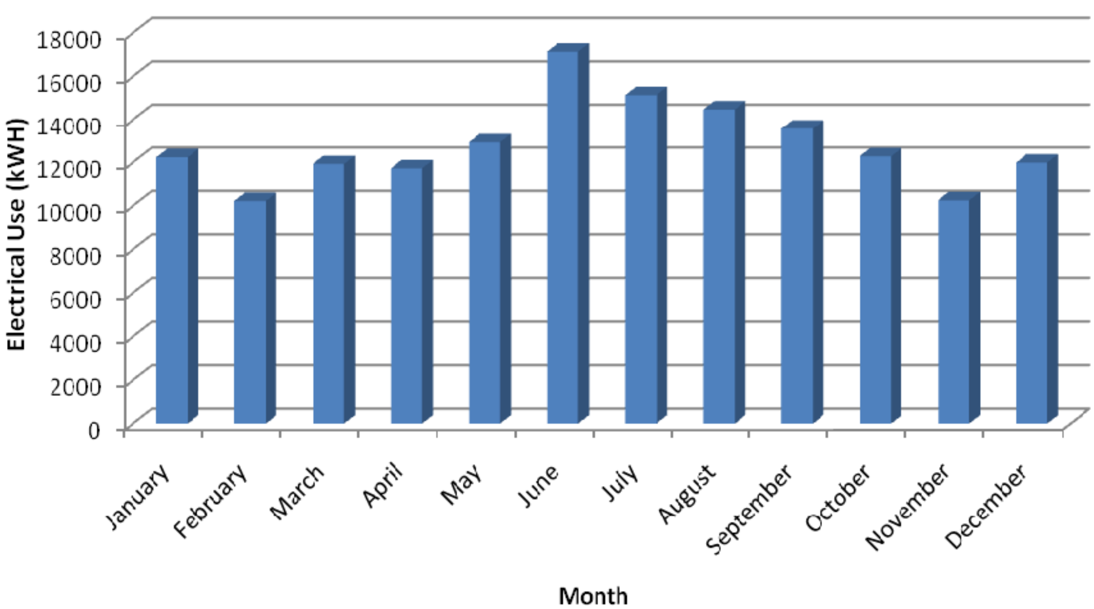
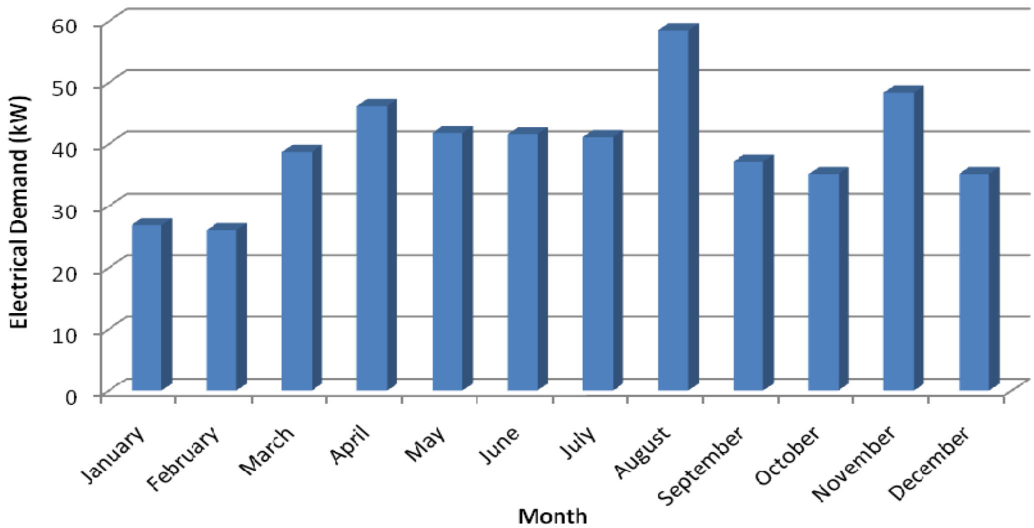


Figure 3.2-2 illustrates the average monthly demand load for the Beach Administration Building from December 2007 through December 2009.

Figure 3.2-2: Beach Administration Building Maximum Monthly Demand



The charges listed below can be found on the electrical bills provided by Atlantic City Electric.

	Acct #: 0181 9579 9996
Customer Charge:	$93.33
Distribution Charge:	$5.34/kW (First 25.00) $5.3394/kW (After 6.60)
	$0.001740/kWh (First 10398)
Market Transition Charge:	$0.002076/kWh (First 10398)
Transition Bond Charge:	$0.005918/kWh
Non-Utility Generation Charge:	$0.004026/kWh
Societal Benefits Charge:	$0.008153/kWh
Infrastructure Investment Surcharge:	$0.000057/kWh
System Control Charge:	$0.000066/kWh
Regulatory Assets Recovery Charge:	$0.000632/kWh

	Acct #: 0181 8539 9997
Customer Charge:	$0.16/day
Distribution Charge:	$0.0425/kWh
Market Transition Charge:	$0.0025/kWh
Transition Bond Charge:	$0.003750/kWh
Non-Utility Generation Charge:	$0.003750/kWh
Societal Benefits Charge:	$0.008750/kWh
Regulatory Assets Recovery Charge:	$0.001250/kWh

	Acct #: 0181 9539 9995
Customer Charge:	$0.16/day
Distribution Charge:	$0.043107/kWh
	$3.80001/kW
Market Transition Charge:	$0.002087/kWh
Transition Bond Charge:	$0.005922/kWh
Non-Utility Generation Charge:	$0.008155/kWh
Societal Benefits Charge:	$0.008155/kWh
Infrastructure Investment Surcharge:	$0.000049/kWh
System Control Charge:	$0.000049/kWh
Regulatory Assets Recovery Charge:	$0.000631/kWh

	Acct #: 0090 0479 9996
Customer Charge:	$0.16/day
Distribution Charge:	$0.42941/kWh
Market Transition Charge:	$0.002353/kWh

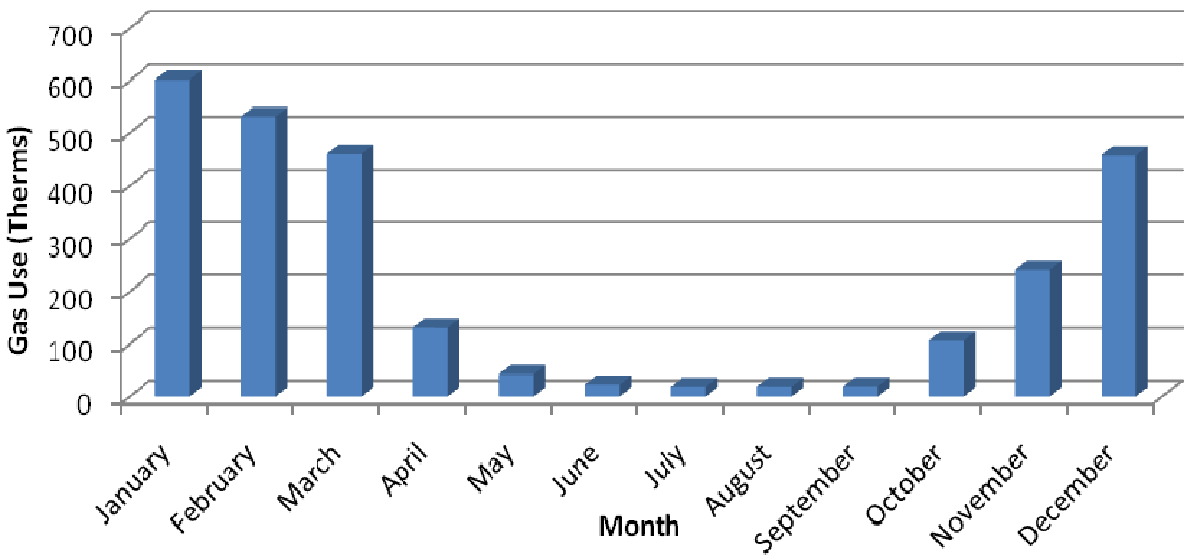
Transition Bond Charge:	$0.005882/kWh
Non-Utility Generation Charge:	$0.004118/kWh
Societal Benefits Charge:	$0.008235/kWh
Regulatory Assets Recovery Charge:	$0.000588/kWh

	Acct #: 1068 2249 9997
Customer Charge:	$0.16/day
Distribution Charge:	$0.043069/kWh
Market Transition Charge:	$0.002079/kWh
Transition Bond Charge:	$0.005941/kWh
Non-Utility Generation Charge:	$0.004059/kWh
Societal Benefits Charge:	$0.008119/kWh
Infrastructure Investment Surcharge:	$0.000099/kWh
System Control Charge:	$0.000099/kWh
Regulatory Assets Recovery Charge:	$0.000594/kWh

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.

The gas usage for the Beach Administration Building is metered at one location. The monthly average gas consumption from December 2007 through December 2009 at the building is illustrated in Figure 3.2-3.

Figure 3.2-3: Beach Administration Building Natural Gas Usage



For more information on the Beach Administration Building's gas usage, refer to Section 4.3.

3.2.2 Dorothy Bullock School

Electric power for the Dorothy Bullock School is fed from one General Secondary Service 3-phase line from Atlantic City Electric. Figure 3.2-4 illustrates the average monthly total energy consumption from December 2007 through December 2009. From this graph, it can be determined that the annual average electrical consumption for the Dorothy Bullock School is approximately 83,000 kWh / month.

Figure 3.2-4: Dorothy Bullock School Electrical Usage

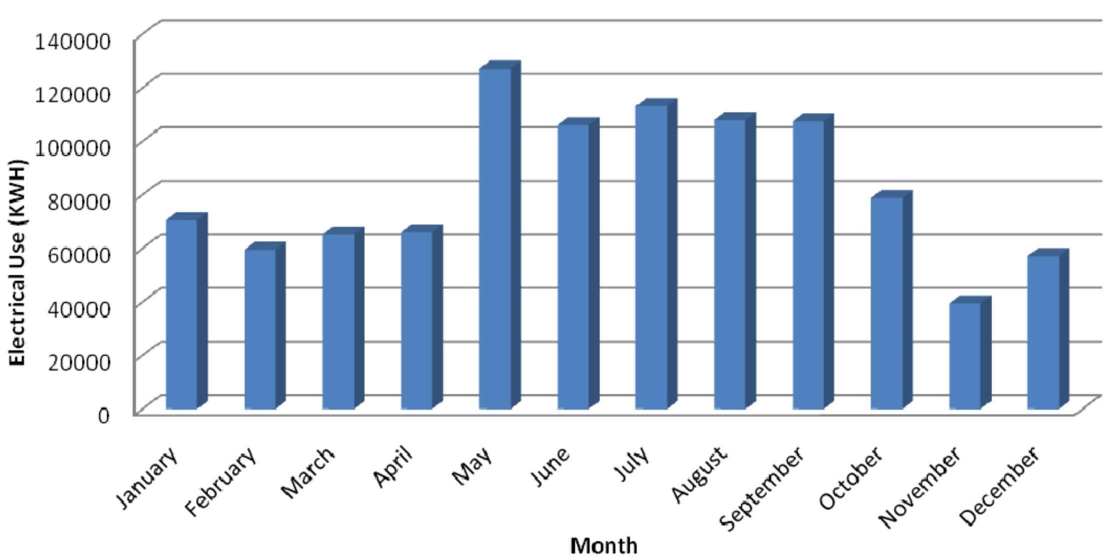
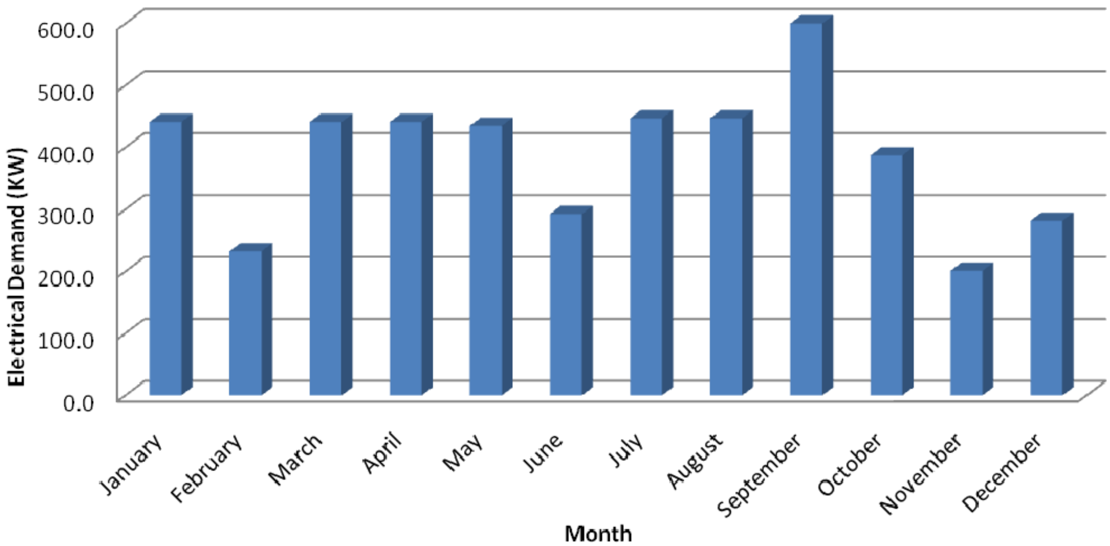


Figure 3.2-5 illustrates the monthly demand load for the Dorothy Bullock School from December 2007 through December 2009.

Figure 3.2-5: Dorothy Bullock School Maximum Monthly Demand



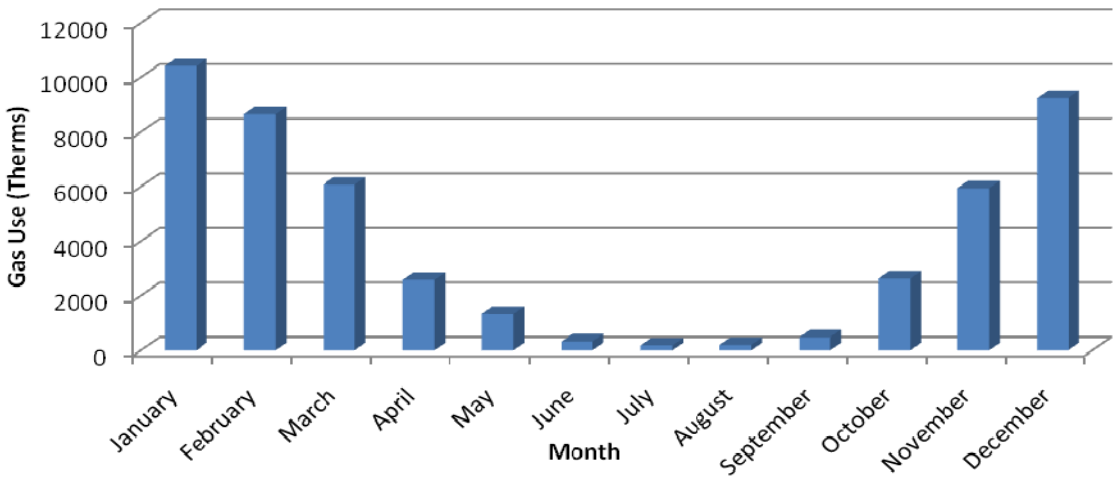
The charges listed below can be found on the electrical bills provided by Atlantic City Electric.

	Acct #: 1148 5439 9994
Customer Charge:	$93.33
Distribution Charge:	$5.34/kW (First 25.00) $5.34/kW (After 210.20)
	$0.001740/kWh
Market Transition Charge:	$0.002076/kWh (First 58800)
Transition Bond Charge:	$0.005918/kWh
Non-Utility Generation Charge:	$0.004026/kWh
Societal Benefits Charge:	$0.008154/kWh
Infrastructure Investment Surcharge:	$0.000057/kWh
System Control Charge:	$0.000066/kWh
Regulatory Assets Recovery Charge:	$0.000632/kWh

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.

The Dorothy Bullock School's monthly average natural gas consumption from December 2007 through December 2009 is illustrated in Figure 3.2-6.

Figure 3.2-6: Dorothy Bullock School Natural Gas Usage



3.2.3 Elsmere School

Electric power for Elsmere School is fed from one General Secondary Service 3-phase line from Atlantic City Electric. Figure 3.2-7 illustrates the average monthly total energy consumption from December 2007 through December 2009. From this graph, it can be determined that the average annual electrical consumption for the Elsmere School is approximately 2,100 kWh / month.

Figure 3.2-7: Elsmere School Electrical Usage

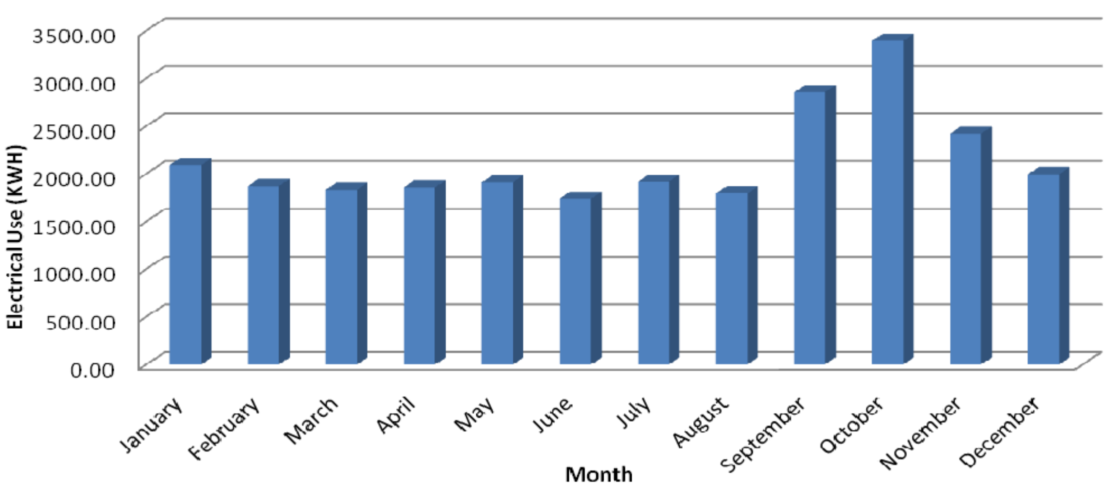
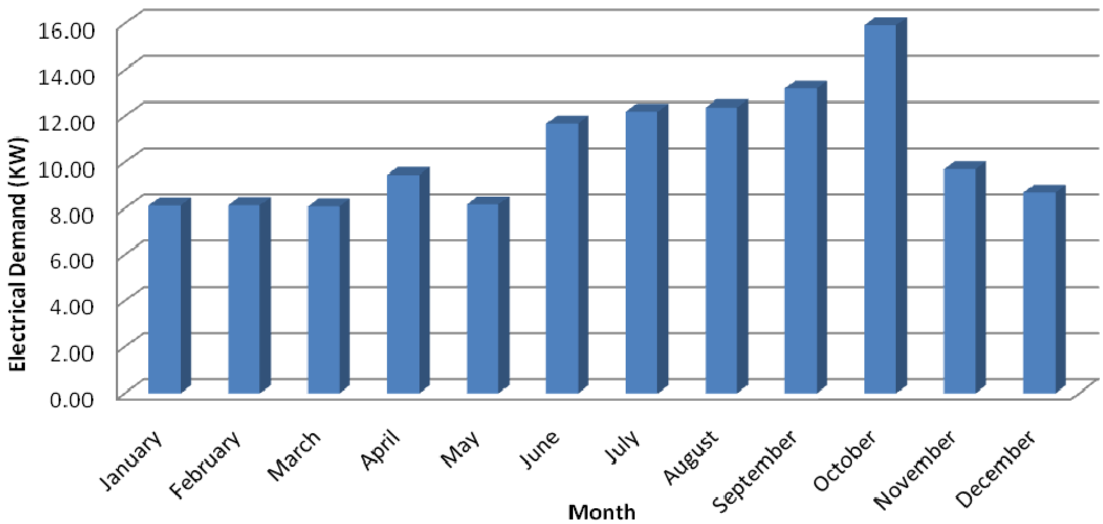


Figure 3.2-8 illustrates the monthly demand load for the Elsmere School from December 2007 through December 2009.

Figure 3.2-8: Elsmere School Maximum Monthly Demand



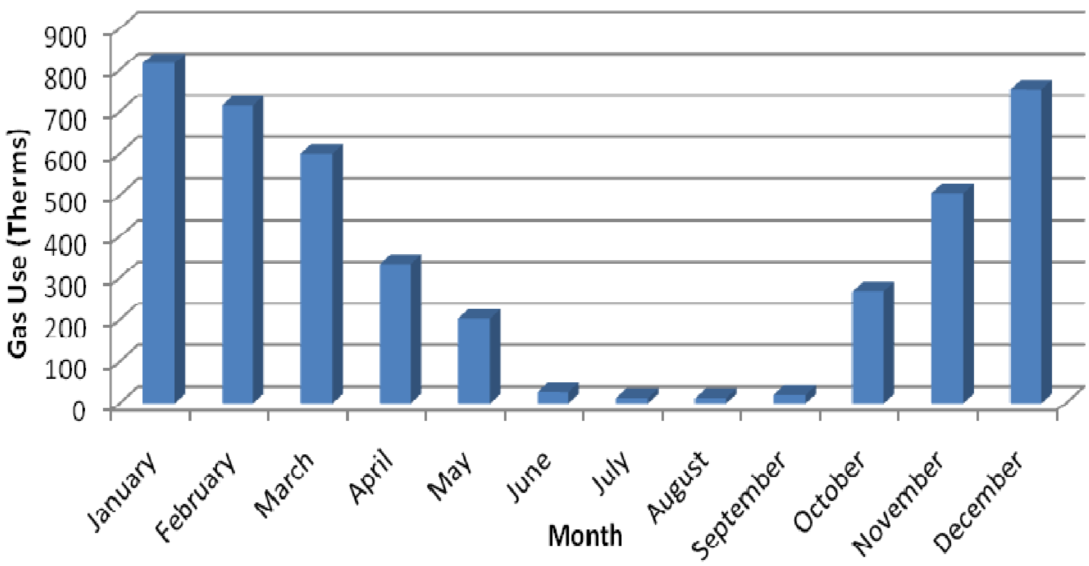
The charges listed below can be found on the electrical bills provided by Atlantic City Electric.

	Acct #: 0224 0649 9990
Customer Charge:	$4.80
Distribution Charge:	$3.80001/kW
	$0.043100/kWh (First 300) $0.021389/kWh (Next 900) $0.021392/kWh (Last 2134)
Market Transition Charge:	$0.002067/kWh (First 300) $0.002078/kWh (Next 900) $0.002076/kWh (Last 2134)
Transition Bond Charge:	$0.005918/kWh
Non-Utility Generation Charge:	$0.004025/kWh
Societal Benefits Charge:	$0.008152/kWh
Infrastructure Investment Surcharge:	$0.000057/kWh
System Control Charge:	$0.000066/kWh
Regulatory Assets Recovery Charge:	$0.000633/kWh

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.

Elsmere School's monthly average natural gas consumption from December 2007 through December 2009 is illustrated in Figure 3.2-9.

Figure 3.2-9: Elsmere School Natural Gas Usage



3.2.4 Glassboro High School

Electric power for the Glassboro High School is fed from three General Secondary Service lines from Atlantic City Electric. The Glassboro High School also has generation supplied by South Jersey Energy. Figure 3.2-10 illustrates the average monthly total energy consumption from December 2007 through December 2009. From this graph, it can be determined that the annual average electrical consumption for the Glassboro High School is approximately 127,000 kWh / month.

Figure 3.2-10: Glassboro High School Electrical Usage

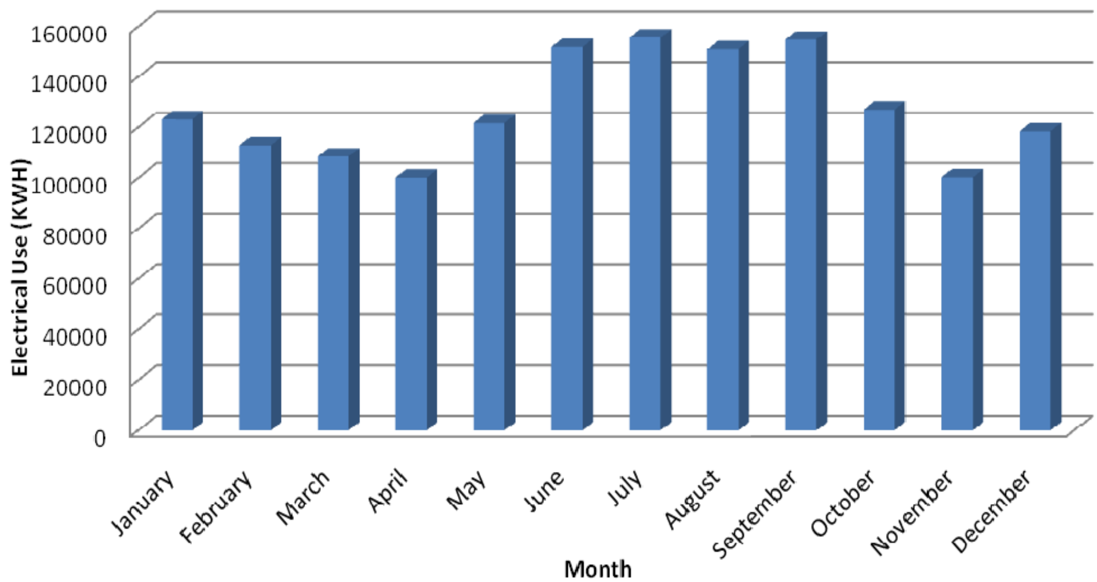
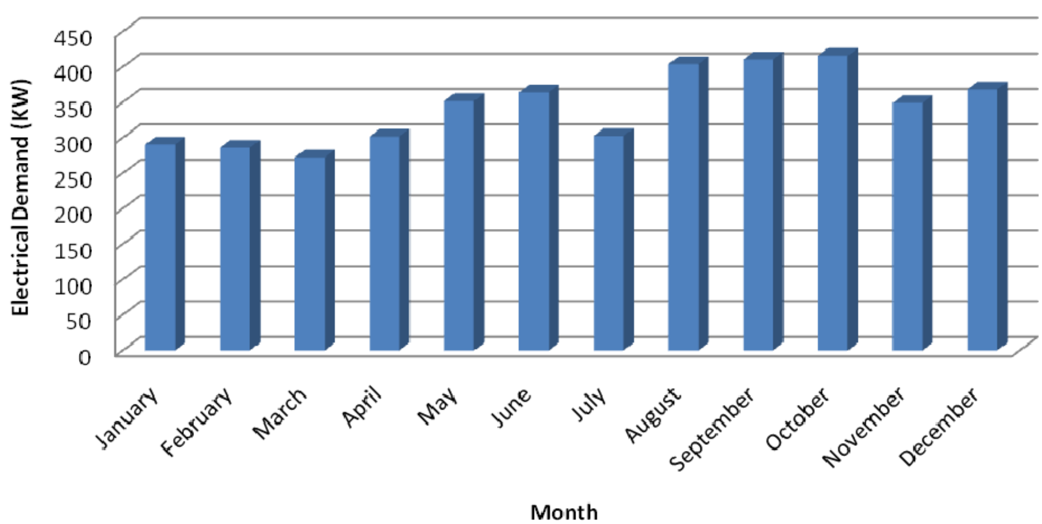


Figure 3.2-11 illustrates the monthly demand load for the Glassboro High School from December 2007 through December 2009.

Figure 3.2-11: Glassboro High School Maximum Monthly Demand



The charges listed below can be found on the electrical bills provided by Atlantic City Electric.

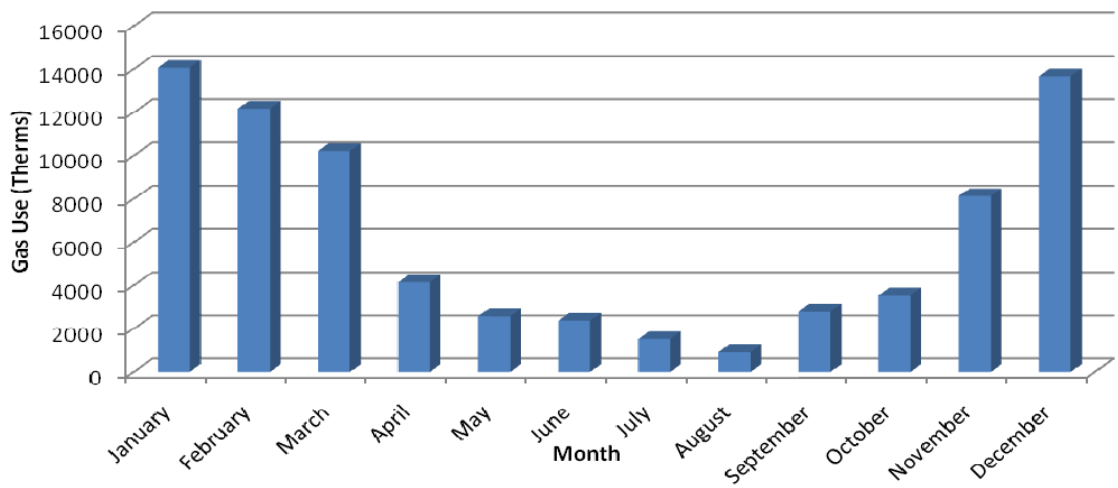
	Acct #: 1148 5439 9937
Customer Charge:	$6.60
Distribution Ceiling Limit:	$0.047671/kWh
Market Transition Charge:	$0.002091/kWh (First 330) $0.002081/kWh (Next 990) $0.002078/kWh (Last 664)
Transition Bond Charge:	$0.005917/kWh
Non-Utility Generation Charge:	$0.004027/kWh
Societal Benefits Charge:	$0.008150/kWh
Infrastructure Investment Surcharge:	$0.000055/kWh
System Control Charge:	$0.000066/kWh
Regulatory Assets Recovery Charge:	$0.000630/kWh

	Acct #: 0181 9549 9993
Customer Charge:	$93.33
Distribution Charge:	$5.34/kWh (First 25.00) $5.34/kWh (Next 255.80)
	$0.001740/kWh (First 82500) $0.001704/kWh (Next 10164) $0.001704/kWh (Last 12936)
Market Transition Charge:	$0.002076/kWh (First 82500) $0.002076/kWh (Next 10164) $0.002076/kWh (Last 12936)
Transition Bond Charge:	$0.005918/kWh
Non-Utility Generation Charge:	$0.004026/kWh
Societal Benefits Charge:	$0.008154/kWh
Infrastructure Investment Surcharge:	$0.000057/kWh
System Control Charge:	$0.000066/kWh
Regulatory Assets Recovery Charge:	$0.000632/kWh

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.

Glassboro High School's monthly average natural gas consumption from December 2007 through December 2009 is illustrated in Figure 3.2-12.

Figure 3.2-12: Glassboro High School Natural Gas Usage



3.2.5 Glassboro Intermediate School

Electric power for the Glassboro Intermediate School is fed from one General Secondary Service 3-phase line from Atlantic City Electric. Figure 3.2-13 illustrates the average monthly total energy consumption from December 2007 through December 2009. From this graph, it can be determined that the average annual electrical consumption for the Glassboro Intermediate School is approximately 80,000 kWh / month.

Figure 3.2-13: Glassboro Intermediate School Electrical Usage

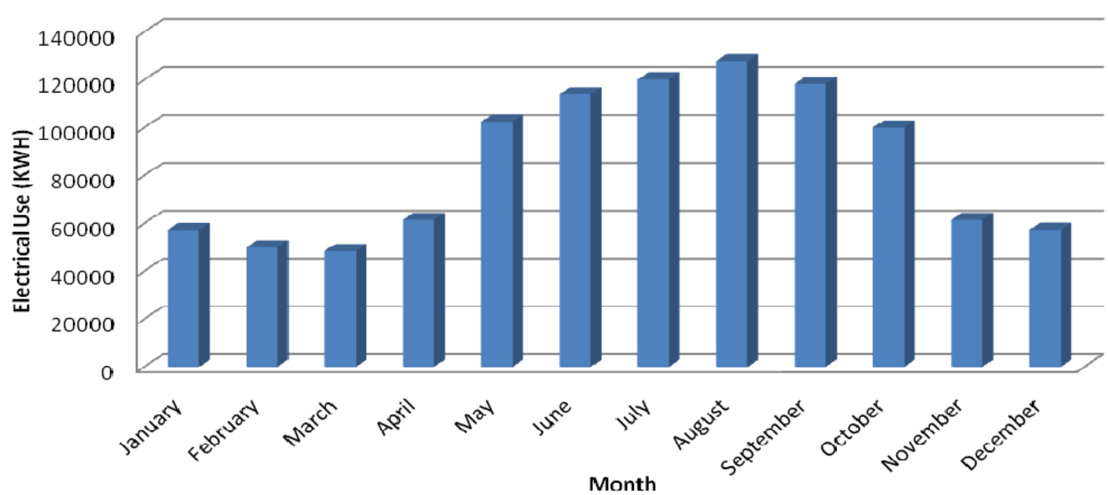
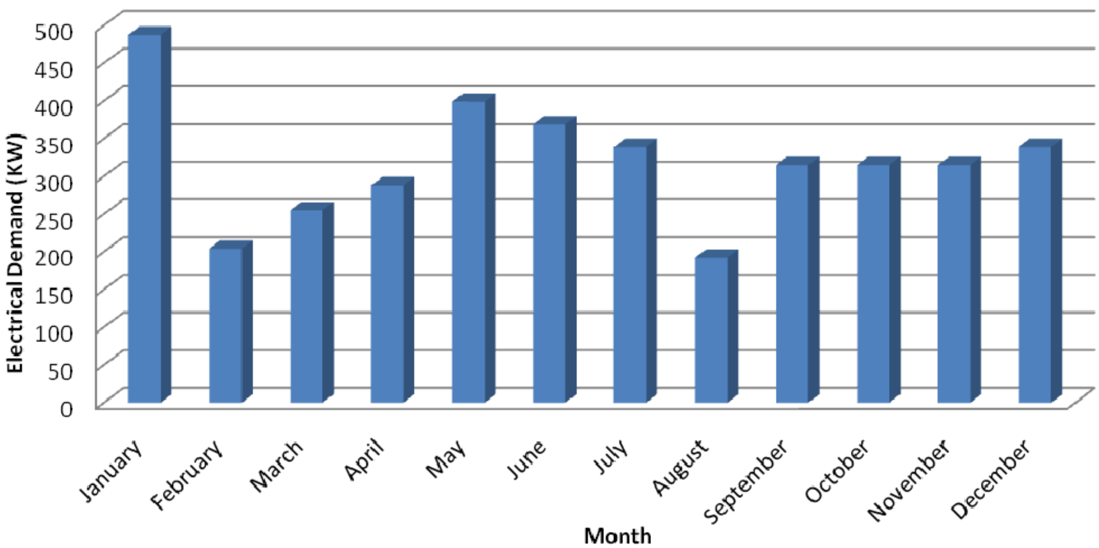


Figure 3.2-14 illustrates the monthly demand load for the Glassboro Intermediate School from December 2007 through December 2009.

Figure 3.2-14: Glassboro Intermediate School Maximum Monthly Demand



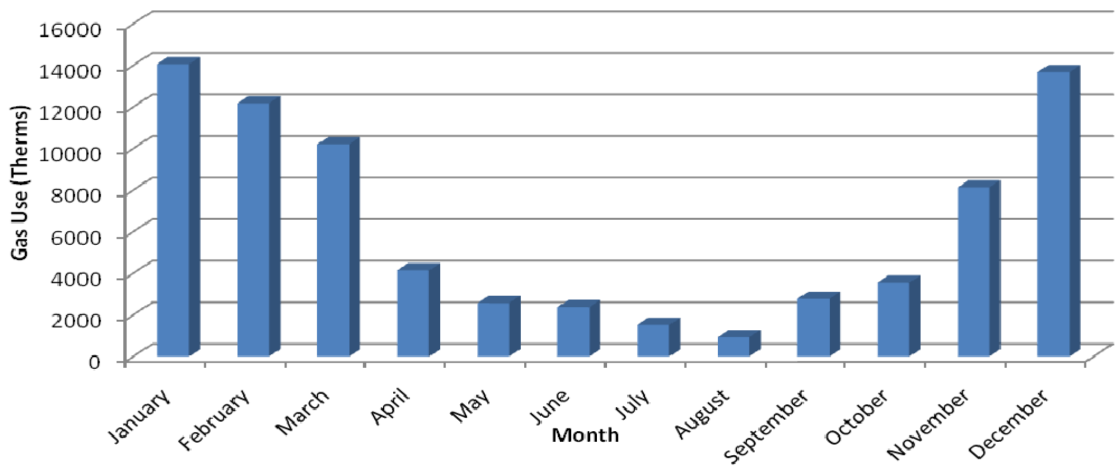
The charges listed below can be found on the electrical bills provided by Atlantic City Electric.

	Acct #: 3234 5689 9984
Customer Charge:	$93.33
Distribution Charge:	$5.34/kW (First 25.00) $5.34/kW (After 266.00)
	$0.001740/kWh
Market Transition Charge:	$0.002076/kWh (First 59700)
Transition Bond Charge:	$0.005918/kWh
Non-Utility Generation Charge:	$0.004026/kWh
Societal Benefits Charge:	$0.008154/kWh
Infrastructure Investment Surcharge:	$0.000057/kWh
System Control Charge:	$0.000066/kWh
Regulatory Assets Recovery Charge:	$0.000632/kWh

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.

Glassboro Intermediate School's monthly average natural gas consumption from December 2007 through December 2009 is illustrated in Figure 3.2-15.

Figure 3.2-15: Glassboro Intermediate School Natural Gas Usage



3.2.6 Glassboro Intermediate School Annex

Electric power for the Glassboro Intermediate School Annex is fed from one General Secondary Service 3-phase line from Atlantic City Electric. Figure 3.2-16 illustrates the average monthly total energy consumption from December 2007 through December 2009. From this graph, it can be determined that the average annual electrical consumption for the Glassboro Intermediate School Annex is approximately 600 kWh / month.

Figure 3.2-16: Glassboro Intermediate School Annex Electrical Usage

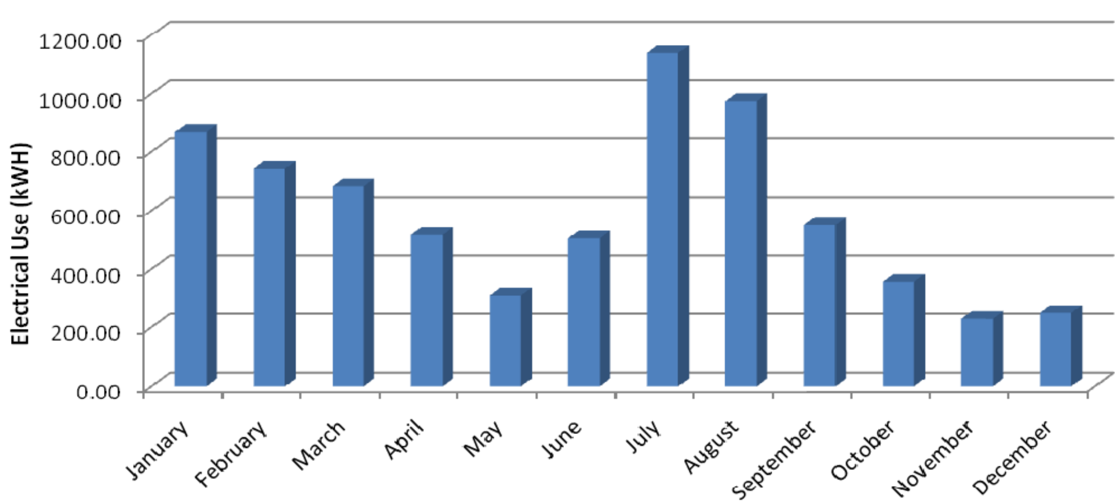
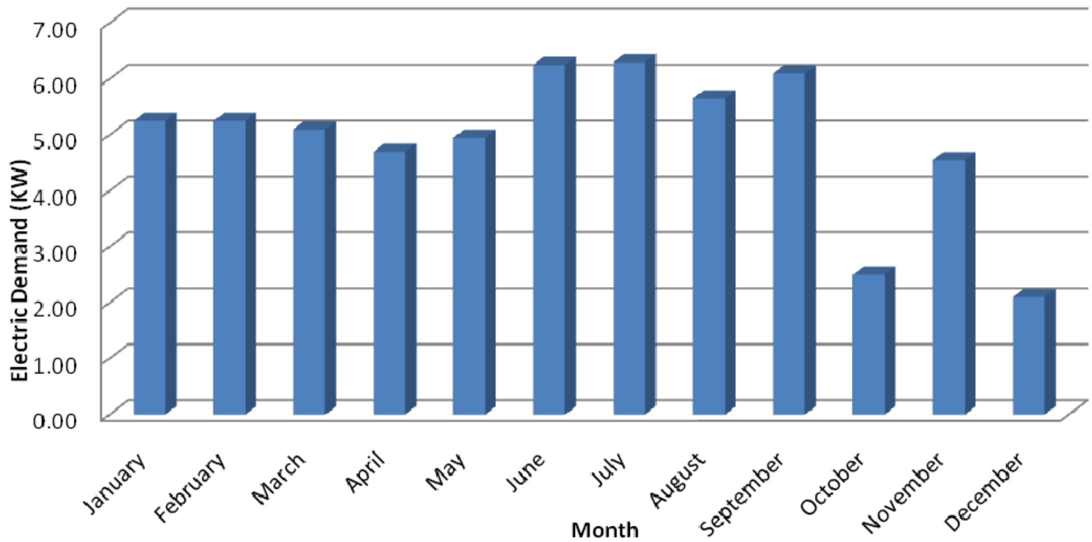


Figure 3.2-17 illustrates the monthly demand load for the Glassboro Intermediate School Annex from December 2007 through December 2009.

Figure 3.2-17: Glassboro Intermediate School Annex Maximum Monthly Demand



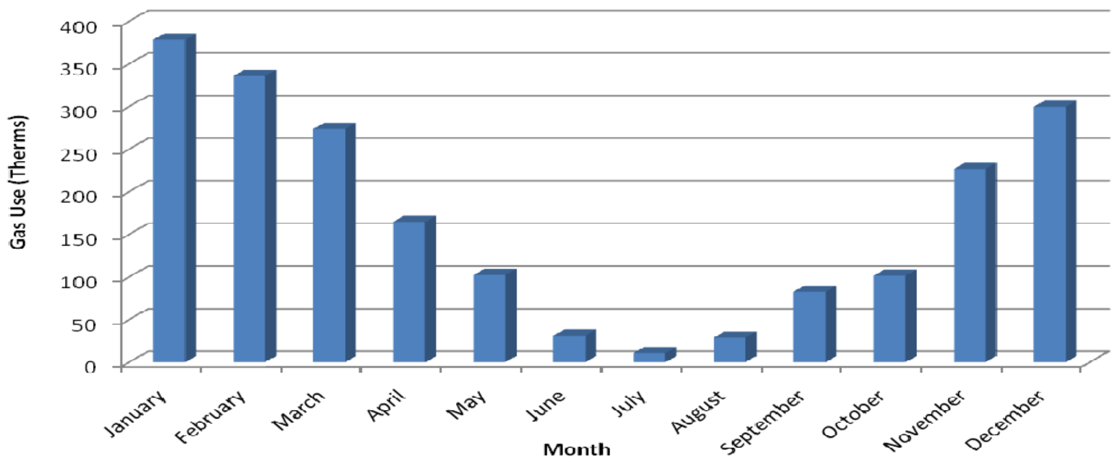
The charges listed below can be found on the electrical bills provided by Atlantic City Electric.

	Acct #: 0182 3179 9992
Customer Charge:	$4.80
Distribution Ceiling Limit:	$0.047714/kWh
Market Transition Charge:	$0.002095/kWh (First 105)
Transition Bond Charge:	$0.005905/kWh
Non-Utility Generation Charge:	$0.004000/kWh
Societal Benefits Charge:	$0.008095/kWh
Infrastructure Investment Surcharge:	$0.000095/kWh
System Control Charge:	$0.000095/kWh
Regulatory Assets Recovery Charge:	$0.000667/kWh

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.

Glassboro Intermediate School Annex's monthly average natural gas consumption from December 2007 through December 2009 is illustrated in Figure 3.2-18.

Figure 3.2-18: Glassboro Intermediate School Annex Natural Gas Usage



3.2.7 J. Harvey Rodgers School

Electric power for J. Harvey Rodgers School is fed from one General Secondary Service 3-phase line from Atlantic City Electric. Figure 3.2-19 illustrates the average monthly total energy consumption from December 2007 through December 2009. From this graph, it can be determined that the average electrical consumption for the J. Harvey Rodgers School is approximately 31,600 kWh / month.

Figure 3.2-19: J. Harvey Rodgers School Electrical Usage

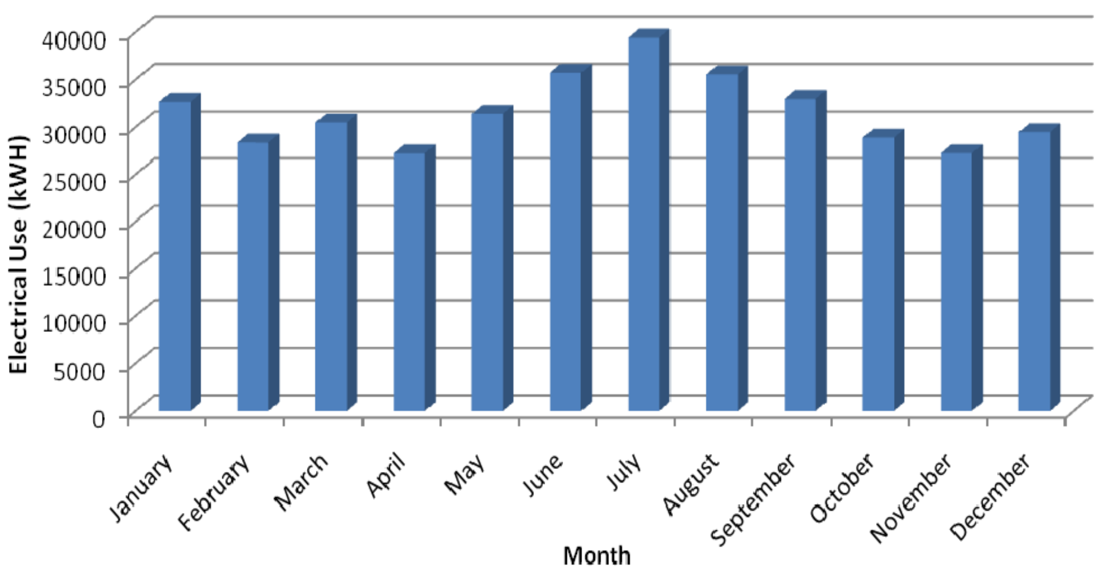


Figure 3.2-20: J. Harvey Rodgers School Maximum Monthly Demand

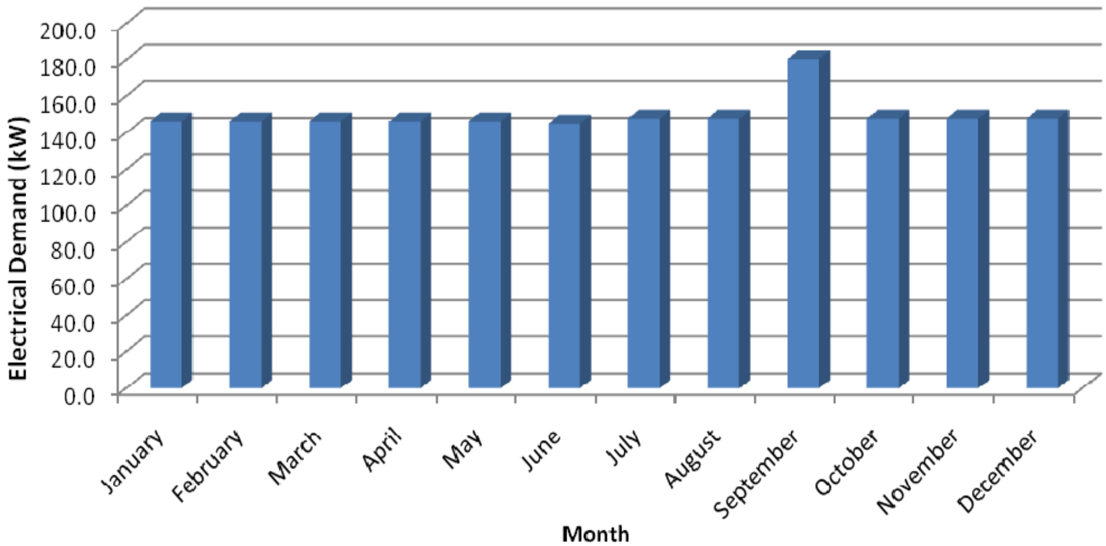


Figure 3.2-20 illustrates the monthly demand load for the J. Harvey Rodgers School from December 2008 through December 2009.

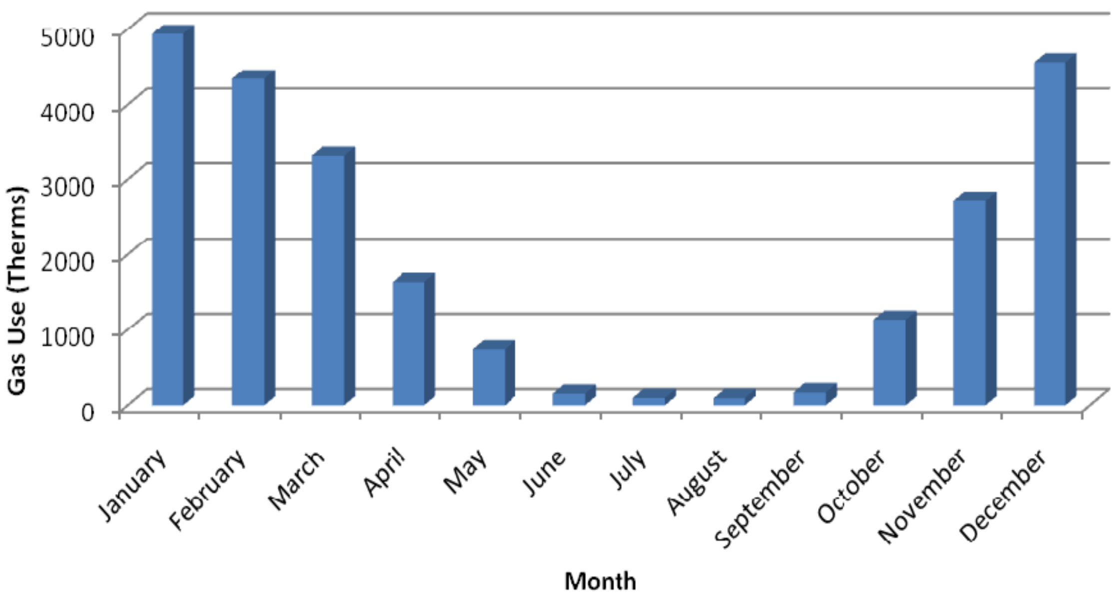
The charges listed below can be found on the electrical bills provided by Atlantic City Electric.

	Acct #: 0222 5479 9954
Customer Charge:	$93.33
Distribution Charge:	$5.34/kW (First 25.00) $5.34/kW (After 123.00)
	$0.001740/kWh
Market Transition Charge:	$0.002076/kWh (First 29200)
Transition Bond Charge:	$0.005918/kWh
Non-Utility Generation Charge:	$0.004026/kWh
Societal Benefits Charge:	$0.008154/kWh
Infrastructure Investment Surcharge:	$0.000057/kWh
System Control Charge:	$0.000066/kWh
Regulatory Assets Recovery Charge:	$0.000632/kWh

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.

J. Harvey Rodgers School's monthly average natural gas consumption from December 2007 through December 2009 is illustrated in Figure 3.2-21.

Figure 3.2-21 J. Harvey Rodgers School Natural Gas Usage



3.2.8 Thomas E. Bowe School

Electric power for the Thomas E. Bowe School is fed from two General Secondary Service 3-phase lines from Atlantic City Electric. Figure 3.2-22 illustrates the average monthly total energy consumption from December 2007 through December 2009. From this graph, it can be determined that the average annual electrical consumption for the Thomas E. Bowe School is approximately 80,000 kWh / month.

Figure 3.2-22: Thomas E. Bowe School Electrical Usage

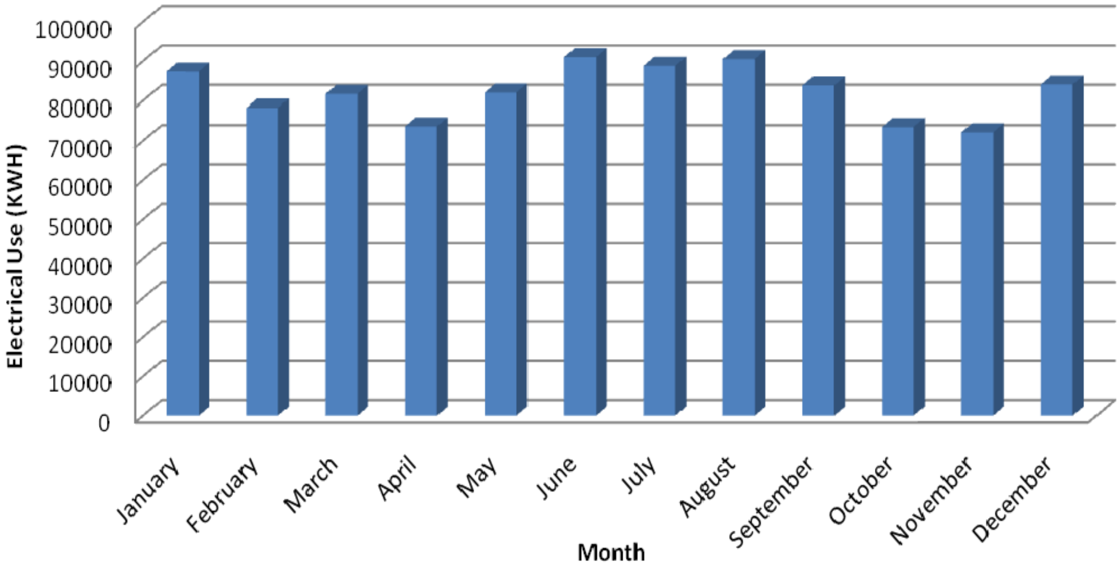
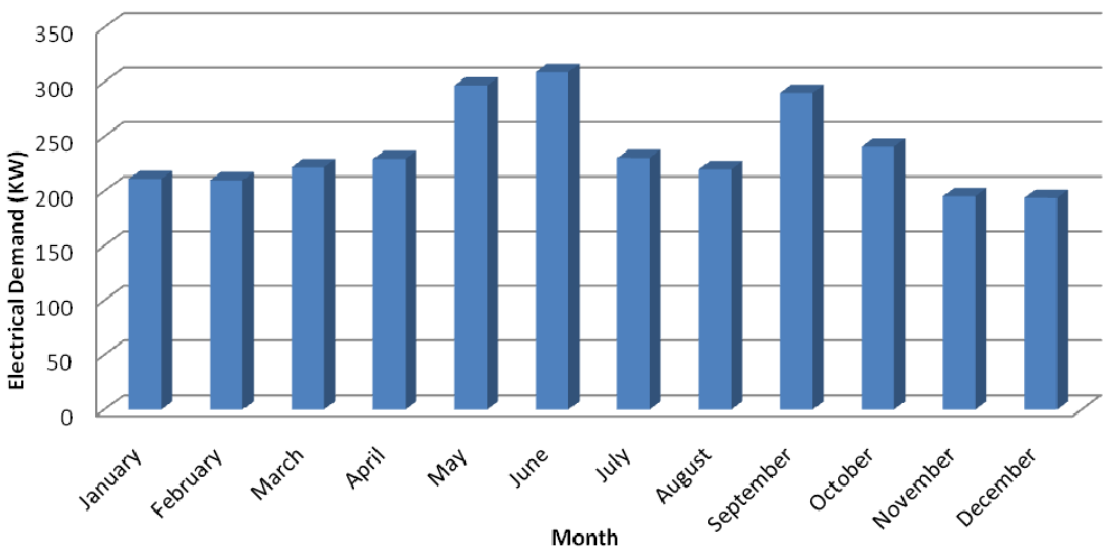


Figure 3.2-23 illustrates the monthly demand load for the Thomas E. Bowe School from December 2007 through November 2009.

Figure 3.2-23: Thomas E. Bowe School Maximum Monthly Demand



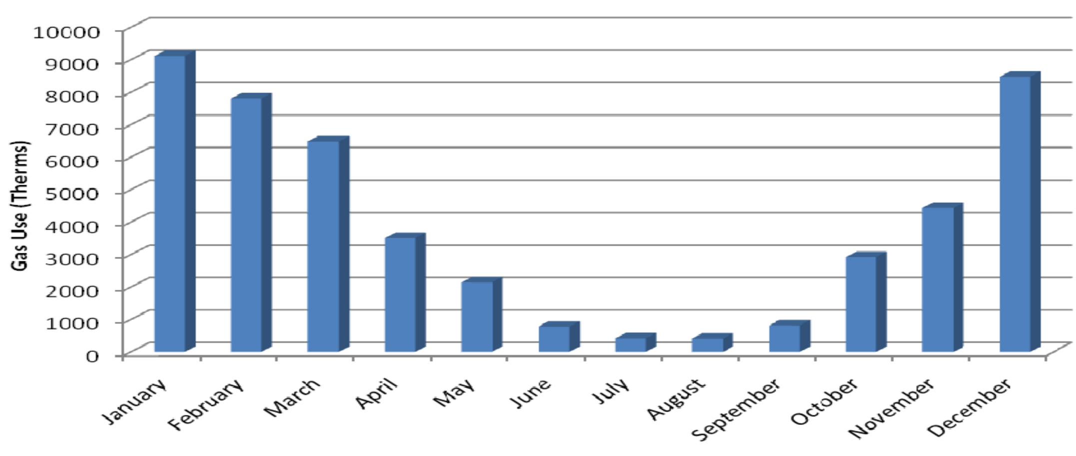
The charges listed below can be found on the electrical bills provided by Atlantic City Electric.

	Acct #: 1068 2249 9963
Customer Charge:	$90.22
Distribution Charge:	$5.162/kW (First 25.00) $5.161971/kW (After 66.62)
	$0.001740/kWh
Market Transition Charge:	$0.002076/kWh (First19137)
Transition Bond Charge:	$0.005918/kWh
Non-Utility Generation Charge:	$0.004026/kWh
Societal Benefits Charge:	$0.008154/kWh
Infrastructure Investment Surcharge:	$0.000057/kWh
System Control Charge:	$0.000066/kWh
Regulatory Assets Recovery Charge:	$0.000632/kWh

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.

Thomas E. Bowe School's monthly average natural gas consumption from December 2007 through December 2009 is illustrated in Figure 3.2-24.

Figure 3.2-24: Thomas E. Bowe School Natural Gas Usage



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
Beach Administration Building	$0.15
Dorothy Bullock School	$0.15
Elsmere School	$0.16
Glassboro High School	$0.13
Glassboro Intermediate School	$0.14
Glassboro Intermediate School Annex	$0.17
J. Harvey Rodgers School	$0.15
Thomas E. Bowe School	$0.14

Table 3.3-2: Natural Gas Aggregate Unit Costs

Service Location	Aggregate $ / Therm
Beach Administration Building	$1.45
Dorothy Bullock School	$1.37
Elsmere School	$1.41
Glassboro High School	$1.41
Glassboro Intermediate School	$1.42
Glassboro Intermediate School Annex	$1.48
J. Harvey Rodgers School	$1.37
Thomas E. Bowe School	$1.37

3.4 Portfolio Manager

3.4.1 Portfolio Manager Overview

Portfolio Manager is an interactive energy management tool that allows the Glassboro School District to track and assess energy consumption at the school facilities in a secure online environment. Portfolio Manager can help the District 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 Glassboro School District, which includes a profile for the eight (8) buildings. The Intermediate School Annex is accounted for in the profile for the Intermediate School. 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 each month to track the buildings' energy usage. The buildings received the following ratings:

Beach Administration Building – 6
Dorothy Bullock School – 34
Elsmere School – 58
Glassboro High School – 18
Glassboro Intermediate School & Annex – 13
J. Harvey Rodgers School – 59
Thomas E. Bowe School – 21

Appendix B contains the Statement 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 District:

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

USERNAME: Glassboro

PASSWORD: EnergyStar

Section 4
Energy Conservation and Retrofit Measures (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 all buildings, with the exception of the Glassboro Intermediate School Annex, which already has energy efficient exterior fixtures. 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. Refer to Appendix D for more information.

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.

It should be noted 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 Beach Administration Building

It is recommended that the existing lighting system at the Beach Administration Building, as discussed in Section 2.1.3, be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade project, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaries to the existing lighting systems. Two options have also been proposed in Appendix D for interior and exterior lighting, and are listed in Table 4.1-1 below.

Table 4.1-1 Beach Administration Building Lighting System Improvements	
Interior Lighting	High Performance T8 Retrofits of T12 fixtures, Incandescent to Compact Fluorescent Conversion, Installation of Occupancy Sensors
Exterior Lighting	Induction Lighting Replacement for Exterior Fixtures

The annual energy savings for the two options is as follows:

Interior Lighting: 0.0 kW, 28.1 kWh and $4.2

Exterior Lighting: 0.6 kW, 2,871.8 kWh and $430.8

The following table, Table 4.1-2, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Beach Administration Building. Included in this 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 Cn=Annual cash flow, and N = number of years.

The IRR expresses an annual rate that results in a break-even point for the investment. If the School District is currently experiencing a lower return on their capital than the IRR, the project is financially advantageous. This measure also allows the School District to compare ECM's against each other to determine the most appealing choices.

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

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

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

Table 4.1-2
Beach Administration Building Lighting System Improvements***

	Interior Lighting	Exterior Lighting	Total
Engineer's Opinion of Probable Cost	$912.0	$1,845.8	$2,757.8
New Jersey SmartStart Rebate	-$120*	-$0*	-$120*
Total Cost	$792.1	$1,845.8	$2,637.8
Annual Energy Savings	$4.2	$430.8	$435.0
Annual Maintenance Cost Savings (AMCS)	$1.09	$235.8	$236.9
Simple Payback	**149.3 years**	**2.8 years**	**3.9 years**
Annual Return on Investment (AROI)	-6.00%	29.50%	18.8%
Lifetime Energy Savings (15 years)**	$78.12	$8,012.4	$8,090.5
Internal Rate of Return (IRR)	NA	38.70%	27.42%
Net Present Value (NPV)	-$715.1	$7,861.8	$7,146.9

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

4.1.2 Dorothy Bullock School

It is recommended that the existing lighting system at the Dorothy Bullock School, as discussed in Section 2.2.3, be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade project, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaries to the existing lighting systems. Two options have also been proposed in Appendix D for interior and exterior lighting, and are listed in Table 4.1-3 below.

Table 4.1-3 Dorothy Bullock School Lighting System Improvements	
Interior Lighting	Incandescent to Compact Fluorescent Conversion, Installation of Occupancy Sensors, Metal Halide High Bay Fixture Conversion to High Bay Fluorescent Fixtures
Exterior Lighting	Induction Lighting Replacement for Exterior Fixtures

The annual energy savings for the two options is as follows:

Interior Lighting: 9.3 kW, 31,805.5 kWh and $4,770.8

Exterior Lighting: 1.4 kW, 6,632.1 kWh and $994.8

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

Table 4.1-4
Dorothy Bullock School Lighting System Improvements***

	Interior Lighting	**Exterior Lighting**	**Total**
Engineer's Opinion of Probable Cost	$26,775.6	$22,295.6	$49,071.2
New Jersey SmartStart Rebate	-$4,735*	-$0*	-$4,735*
Total Cost	$22,040.6	$22,295.6	$44,336.2
Annual Energy Savings	$4,770.8	$994.8	$5,765.6
Annual Maintenance Cost Savings (AMCS)	$150.7	$10.95	$161.62
Simple Payback	**4.5 years**	**22.2 years**	**7.5 years**
Annual Return on Investment (AROI)	15.66%	-2.16%	6.70%
Lifetime Energy Savings (15 years)**	$88,731.7	$18,502.2	$107,233.9
Internal Rate of Return (IRR)	23.94%	-1.99%	13.07%
Net Present Value (NPV)	$49,631.3	-$7,648.8	$41,982.5

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

It is recommended that the existing lighting system at the Elsmere School, as discussed in Section 2.3.3, be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade project, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaries to the existing lighting systems. Two options have also been proposed in Appendix D for interior and exterior lighting, and are listed in Table 4.1-5 below.

Table 4.1-5 Elsmere School Lighting System Improvements	
Interior Lighting	Incandescent to Compact Fluorescent Conversion, Installation of Occupancy Sensors
Exterior Lighting	Induction Lighting Replacement for Exterior Fixtures

The annual energy savings for the two options is as follows:

Interior Lighting: 0.1 kW, 566.2 kWh and $90.6

Exterior Lighting: 0.4 kW, 1,880.5 kWh and $300.9

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

Table 4.1-6
Elsmere School Building Lighting System Improvements***

	Interior Lighting	**Exterior Lighting**	**Total**
Engineer's Opinion of Probable Cost	$1,086.8	$5,945.5	$7,032.3
New Jersey SmartStart Rebate	-$0****	-$0****	-$0****
Total Cost	$1,086.8	$5,945.5	$7,032.3
Annual Energy Savings	$90.6	$300.9	$391.5
Annual Maintenance Cost Savings (AMCS)	$47.01	$7.3	$54.31
Simple Payback	**7.9 years**	**19.3 years**	**15.8 years**
Annual Return on Investment (AROI)	6.00%	-1.48%	-0.33%
Lifetime Energy Savings (15 years)**	$1,685.1	$5,596.4	$7,281.5
Internal Rate of Return (IRR)	12.11%	-0.42%	1.99%
Net Present Value (NPV)	$917.23	-$1,457.2	-$539.32

* Additional incentives, based on eligibility, are available through the New Jersey SmartStart Program, see Appendix G.
**3% yearly inflation on electricity costs.
***See Appendix H & I for ECRM Financial Analyses.
**** No incentives are available for this building due to the lack of incentives for the replacements being made.

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 Glassboro High School

It is recommended that the existing lighting system at the Glassboro High School, as discussed in Section 2.4.3, be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade project, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaries to the existing lighting systems. Two options have also been proposed in Appendix D for interior and exterior lighting, and are listed in Table 4.1-7 below.

Table 4.1-7 Glassboro High School Lighting System Improvements	
Interior Lighting	Incandescent to Compact Fluorescent Conversion, Installation of Occupancy Sensors, Metal Halide High Bay Fixture Conversion to High Bay Fluorescent Fixtures
Exterior Lighting	Induction Lighting Replacement for Exterior Fixtures

The annual energy savings for the two options is as follows:

Interior Lighting: 10.9 kW, 36,147.2 kWh and $4,699.1

Exterior Lighting: 4.8 kW, 24,737.5 kWh and $3,215.9

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

Table 4.1-8
Glassboro High School Lighting System Improvements***

	Interior Lighting	**Exterior Lighting**	**Total**
Engineer's Opinion of Probable Cost	$28,547.3	$32,734.8	$61,282.1
New Jersey SmartStart Rebate	-$5.060*	-$1,050*	-$6,110

Table 4.1-8 Glassboro High School Lighting System Improvements* **			
Total Cost	$23,487.3	$31,684.8	$55,172.1
Annual Energy Savings	$4,699.1	$3,215.9	$7,915
Annual Maintenance Cost Savings (AMCS)	$235.1	$28.32	$263.4
Simple Payback	**4.8 years**	**9.8 years**	**6.7 years**
Annual Return on Investment (AROI)	14.34%	3.57%	8.16%
Lifetime Energy Savings (15 years)**	$87,398.2	$59,812.3	$147,210.4
Internal Rate of Return (IRR)	22.44%	8.63%	14.98%
Net Present Value (NPV)	$48,369.4	$15,561.1	$63,930.5

* Additional incentives, based on eligibility, are available through the New Jersey SmartStart Program, see Appendix G.
**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 Glassboro Intermediate School

It is recommended that the existing lighting system at the Glassboro Intermediate School, as discussed in Section 2.5.3, be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade project, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaries to the existing lighting systems. Two options have also been proposed in Appendix D for interior and exterior lighting, and are listed in Table 4.1-9 below.

Table 4.1-9 Glassboro Intermediate School Lighting System Improvements	
Interior Lighting	Incandescent to Compact Fluorescent Conversion, Installation of Occupancy Sensors
Exterior Lighting	Induction Lighting Replacement for Exterior Fixtures

The annual energy savings for the two options is as follows:

Interior Lighting: 0.2 kW, 2,458.8 kWh and $334.2

Exterior Lighting: 0.5 kW, 1662.2 kWh and $232.7

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

Table 4.1-10
Glassboro Intermediate School Lighting System Improvements***

	Interior Lighting	Exterior Lighting	Total
Engineer's Opinion of Probable Cost	$5,000.3	$8,175.1	$13,175.4
New Jersey SmartStart Rebate	-$665*	-$0*	-$665*
Total Cost	$4,335.3	$8,175.1	$12,510.4
Annual Energy Savings	$344.2	$232.7	$576.9
Annual Maintenance Cost Savings (AMCS)	117.5	$4.02	$121.6
Simple Payback	**9.4 years**	**34.5 years**	**17.9 years**
Annual Return on Investment (AROI)	80.75%	-3.77%	25.52%
Lifetime Energy Savings (15 years)**	$68,297.1	$4,328	$72,626.9
Internal Rate of Return (IRR)	90.40%	-6.53%	34.60%
Net Present Value (NPV)	$50,853.5	-$4,727.7	$46,127.2

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

4.1.6 Glassboro Intermediate School Annex

It is recommended that the existing lighting system at the Glassboro Intermediate School Annex, as discussed in Section 2.6.3, be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade project, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaries to the existing lighting systems. One option has been proposed in Appendix D for interior lighting, and is listed in Table 4.1-11 below.

Table 4.1-11
Glassboro Intermediate School Annex Lighting System Improvements

Interior Lighting	Installation of Occupancy Sensors

The annual energy savings is as follows:

Interior Lighting: 0.0 kW, 3,516.4 kWh and $597.8

The following table, Table 4.1-12, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Glassboro Intermediate School Annex.

Table 4.1-12 Glassboro Intermediate School Annex Lighting System Improvements***	
	Interior Lighting
Engineer's Opinion of Probable Cost	$1,268.6
New Jersey SmartStart Rebate	-$210*
Total Cost	$1,058.6
Annual Energy Savings	$597.8
Annual Maintenance Cost Savings (AMCS)	$0****
Simple Payback	**1.8 years**
Annual Return on Investment (AROI)	40.46%
Lifetime Energy Savings (15 years)**	$11,118.4
Internal Rate of Return (IRR)	49.95%
Net Present Value (NPV)	$7,437.2

* Additional incentives, based on eligibility, are available through the New Jersey SmartStart Program, see Appendix G.
**3% yearly inflation on electricity costs.
***See Appendix H & I for ECRM Financial Analyses.
**** No maintenance cost savings is attributed to the types of improvements being made.

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.

4.1.7 J. Harvey Rodgers School

It is recommended that the existing lighting system at the J. Harvey Rodgers School, as discussed in Section 2.7.3, be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade project, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaries to the existing lighting systems. Two options have also been proposed in Appendix D for interior and exterior lighting, and are listed in Table 4.1-13 below.

Table 4.1-13 J. Harvey Rodgers School Lighting System Improvements	
Interior Lighting	High Performance T8 Retrofits, Incandescent to Compact Fluorescent Conversion, Occupancy Sensors
Exterior Lighting	Induction Lighting Replacement for Exterior Fixtures

The annual energy savings for the two options is as follows:

Interior Lighting: 3.2 kW, 10,415.6 kWh and $1,562.3

Exterior Lighting: 0.9 kW, 4,701.2 kWh and $705.2

The following table, Table 4.1-14, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the J. Harvey Rodgers School.

Table 4.1-14

J. Harvey Rodgers School Lighting System Improvements***

	Interior Lighting	**Exterior Lighting**	**Total**
Engineer's Opinion of Probable Cost	$8,751.5	$14,863.8	$23,615.3
New Jersey SmartStart Rebate	-$1,780*	-$0*	-$1,780*
Total Cost	$6,971.5	$14,863.8	$21,835.3
Annual Energy Savings	$1,562.3	$705.2	$2,267.5
Annual Maintenance Cost Savings (AMCS)	$244.6	$25.6	$270.1
Simple Payback	**3.9 years**	**20.3 years**	**8.6 years**
Annual Return on Investment (AROI)	19.25%	-1.75%	4.95%
Lifetime Energy Savings (15 years)**	$29,057.1	$13,116	$42,173
Internal Rate of Return (IRR)	27.91%	-1.03%	10.66%
Net Present Value (NPV)	$19,341.9	-$4,221.8	$15,120

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

4.1.8 Thomas E. Bowe School

It is recommended that the existing lighting system at the Thomas E. Bowe School, as discussed in Section 2.8.3, be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade project, as presented in Appendix D, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaries to the existing lighting systems. Two options have also been proposed in Appendix D for interior and exterior lighting, and are listed in Table 4.1-15 below.

Table 4.1-15 Thomas E. Bowe School Lighting System Improvements	
Interior Lighting	Incandescent to Compact Fluorescent Conversion, Installation of Occupancy Sensors, Metal Halide High Bay Fixture Conversion to High Bay Fluorescent Fixtures
Exterior Lighting	Induction Lighting Replacement for Exterior Fixtures

The annual energy savings for the two options is as follows:

Interior Lighting: 7.4 kW, 25,472.8 kWh and $3,566.2

Exterior Lighting: 6.9 kW, 35,345.9 kWh and $4,948.4

The following table, Table 4.1-16, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Thomas E. Bowe School.

Table 4.1-16
Thomas E. Bowe School Lighting System Improvements***

	Interior Lighting	**Exterior Lighting**	**Total**
Engineer's Opinion of Probable Cost	$19,948.9	$54,147.8	$74,096.7
New Jersey SmartStart Rebate	-$3,585*	-$1,330*	-$4,915*
Total Cost	$16,363.9	$52,817.8	$69,181.7
Annual Energy Savings	$3,566.2	$4,948.4	$8,517.6
Annual Maintenance Cost Savings (AMCS)	$120.5	$39.9	$160.5
Simple Payback	**4.4 years**	**10.6 years**	**8.0 years**
Annual Return on Investment (AROI)	15.86%	2.78%	5.87%
Lifetime Energy Savings (15 years)**	$66,327.5	$92,035	$158,362.3
Internal Rate of Return (IRR)	24.16%	7.41%	11.94%
Net Present Value (NPV)	$37,326.5	$19,828	$57,154

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

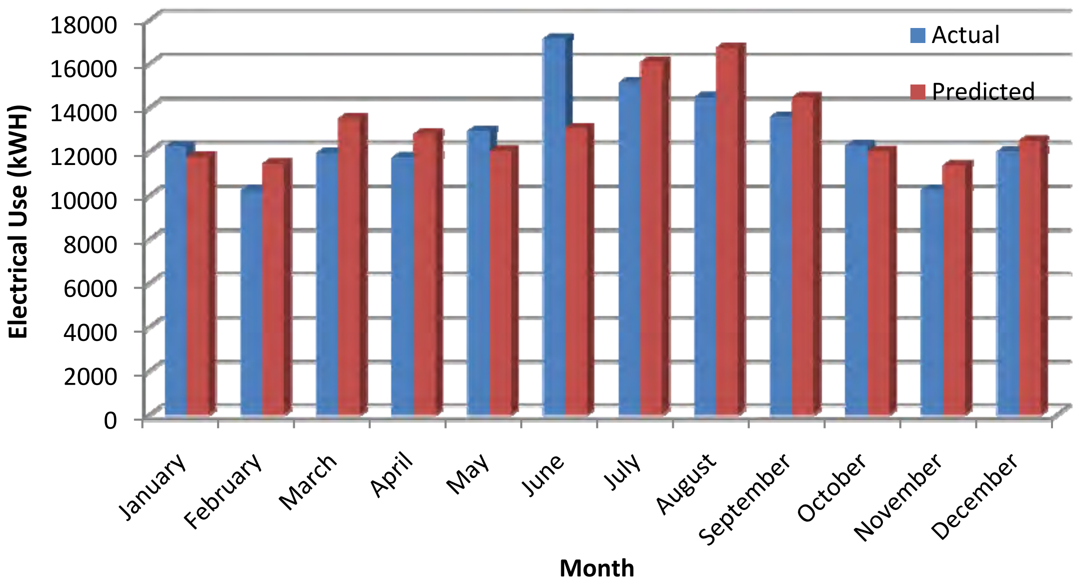
Each building is modeled using software called eQuest, a Department of Energy-sponsored energy modeling program, to establish a baseline space heating and cooling energy usage. Climate data from Glassboro, NJ was used for analyses. From this, the model may be calibrated, using historical utility bills,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

A model of the Beach Administration Building was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity and natural gas bills from January, 2008 through November, 2009. Figure 4.2.1-1 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 two years, to yield an approximate average usage during the month of June.

Figure 4.2.1-1: Beach Administration Building Electricity Usage



The spike in June could be attributed to the cooling units running at lower temperatures and/or running for longer periods of time. The electric usage in June of 2008 is 29% higher than the highest usage of any month throughout the 23 months of supplied data. The annual predicted electricity usage was still within 3% of the actual 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 4.2.1-2 presents this information to help the District visualize where CDM anticipates the electricity is ultimately being used.

Figure 4.2.1-2: Beach Administration Building Electricity Usage Breakdown

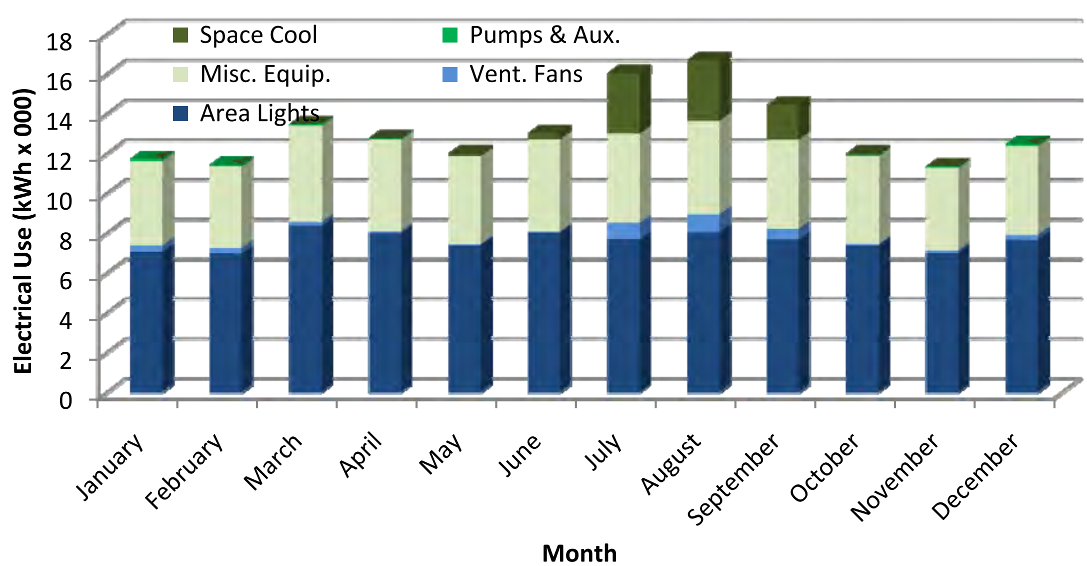


Figure 4.2.1-3 below compares actual electrical demand to model-predicted electrical demand.

Figure 4.2.1-3: Beach Administration Building Electric Demand

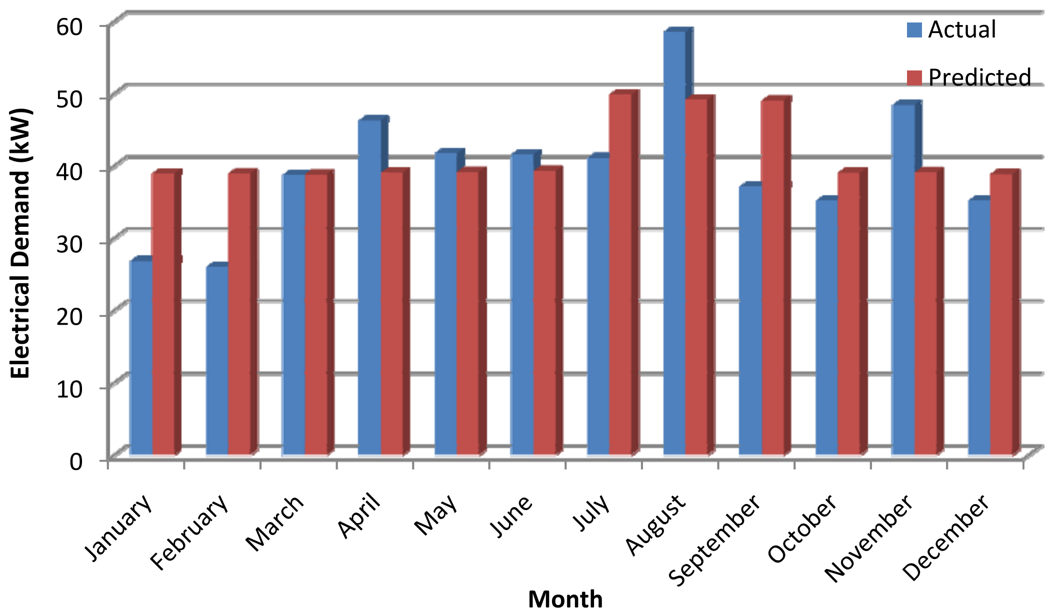
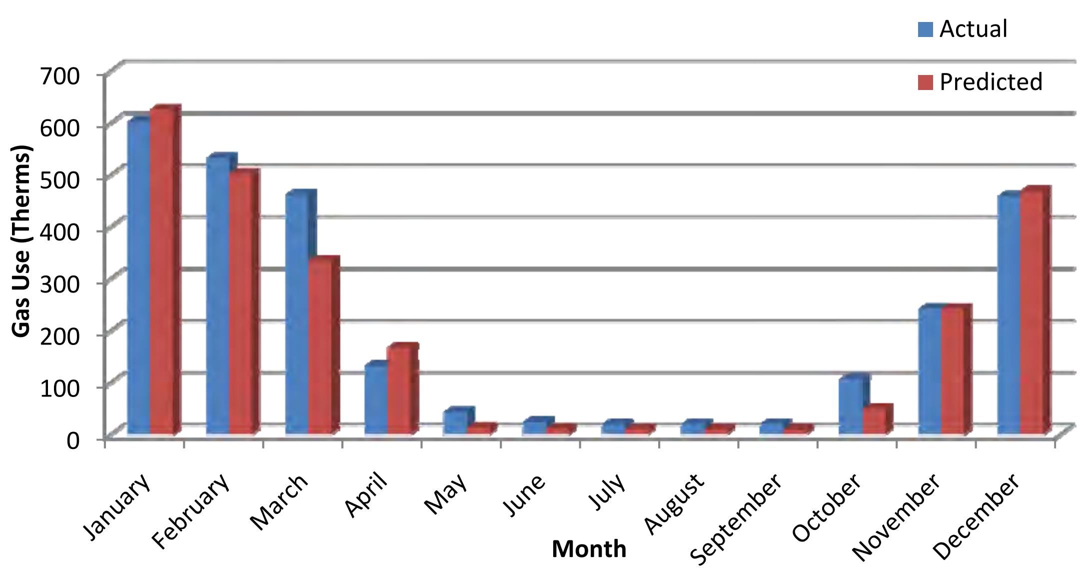


Figure 4.2.1-4 below compares actual natural gas usage to model-predicted natural gas use. The gas consumption is mostly attributed to two (2) gas fired furnaces that provide heating for the building. The annual predicted gas usage was modeled within 10% of the actual usage.

Figure 4.2.1-4: Beach Administration Building Gas Usage



The existing HVAC equipment appeared to be in good condition and did not warrant immediate replacement. CDM therefore had no HVAC-related recommendations for this building.

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 make-up air unit has a median service life of 20 years. Therefore, if a make-up air unit has been in service for more than 20 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 4.2.1-1 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 4.2.1-1 Beach Administration Building HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Duct Furnace	Mechanical Closet	Office	Sterling	CD-200	77%	Unknown	18
Duct Furnace	Server Room Closet	Office	Sterling	CD-200	77%	Unknown	18
Portable Air Conditioning Unit	Server Room	Server Room	Sea Breeze	PSAS12B	9 EER	Unknown	15
Portable AC Unit	Server Room	Server Room	Sea Breeze	PSAS12B	9 EER	Unknown	15
Wall Mounted Air Conditioning Unit	Server Room	Server Room	Sanyo	KS2432A	~ 17 SEER	8	15
Condensing Unit	Outside Northwest Wall	Office	Trane	BTA9900300K0	Unknown	Unknown	15
Condensing Unit	Outside Northwest Wall	Office	Sanyo	CL2432	~17 SEER	16	15

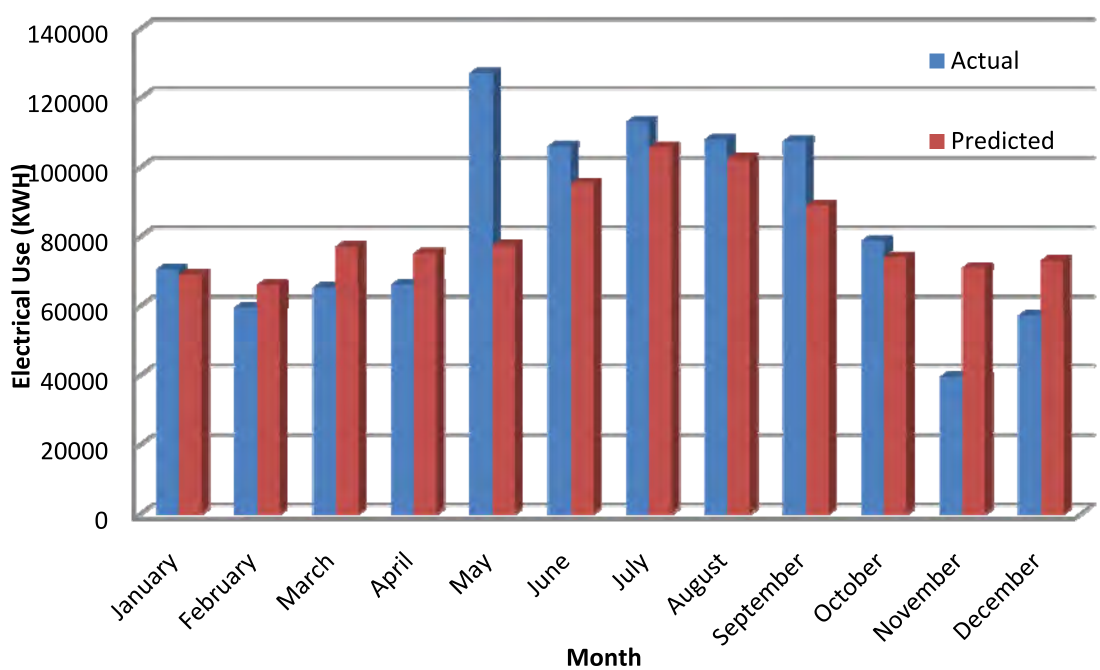
CDM also takes an inventory of the observed domestic water heaters. This will inform the District of any water heaters that are in need of replacement. Equipment observed to be in poor or aging condition would warrant replacement, as they are likely not operating at peak efficiency. This domestic water heater inventory may be seen as Table 4.2.1-2 below.

Table 4.2.1-2 Beach Administration Building Domestic Water Heaters					
Location	Make	Storage Capacity (Gallons)	Type	Heating Capacity	Estimated Age (Years)
Mechanical Closet	Bradford White	40	Gas	40 MBH	7

4.2.2 Dorothy Bullock School

A model of the Dorothy Bullock School was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity and natural gas bills from January, 2008 through November, 2009. Figure 4.2.2-1 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 two years, to yield an approximate average usage during the month of June.

Figure 4.2.2-1: Dorothy Bullock School Electricity Usage



The spike in May is extremely unusual considering it is a shoulder month (low heating, low cooling loads). The electric usage in May of 2008 is 37% higher than the highest usage of any month throughout the 23 months of supplied data. The annual predicted electricity usage was still within 3% of the actual 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 4.2.2-2 presents this information to help the District visualize where CDM anticipates the electricity is ultimately being used.

Figure 4.2.2-2: Dorothy Bullock School Usage Breakdown

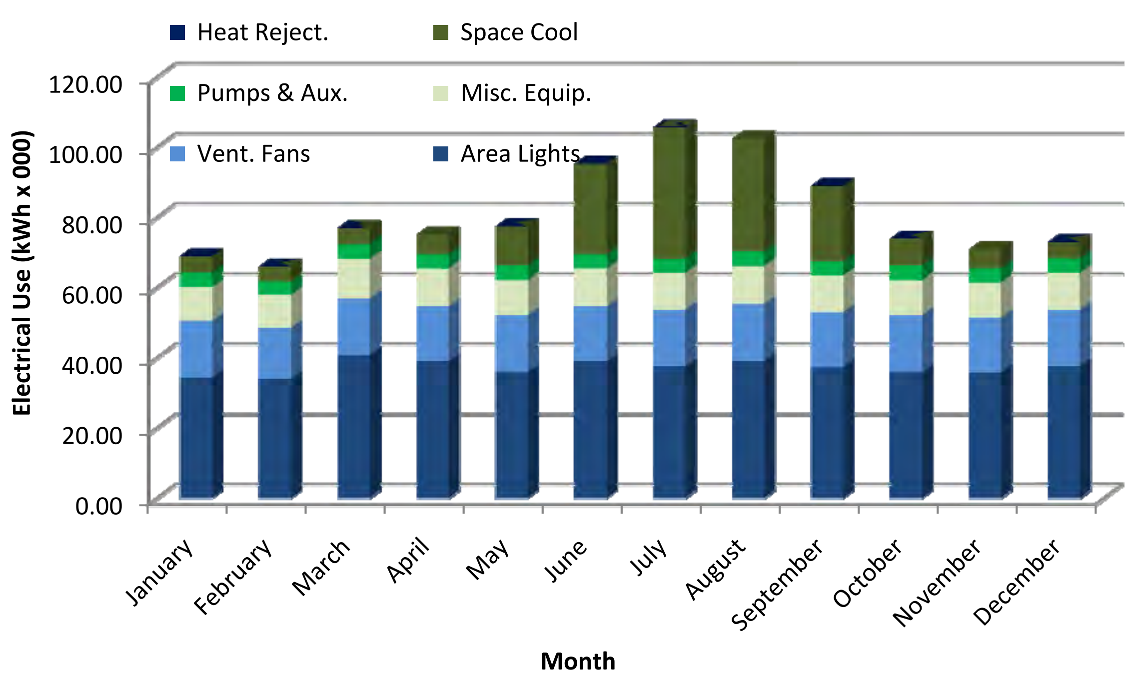
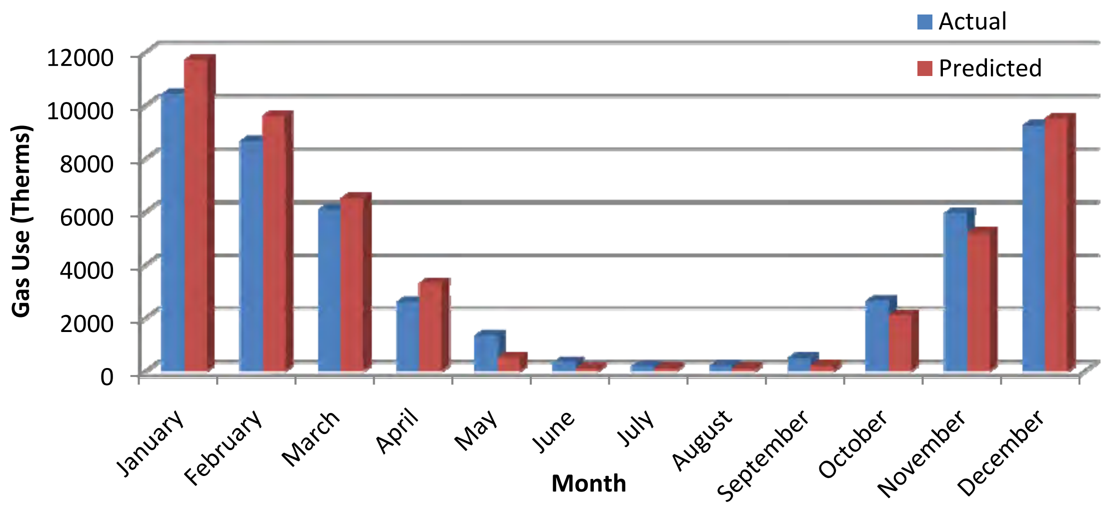


Figure 4.2.2-3 below compares actual natural gas usage to model-predicted natural gas use. While some natural gas is used for domestic water heating and cooking, the boilers account for the majority of the natural gas usage at the school. The annual predicted gas usage was modeled within 2% of the actual usage.

Figure 4.2.2-3: Dorothy Bullock School Natural Gas Usage



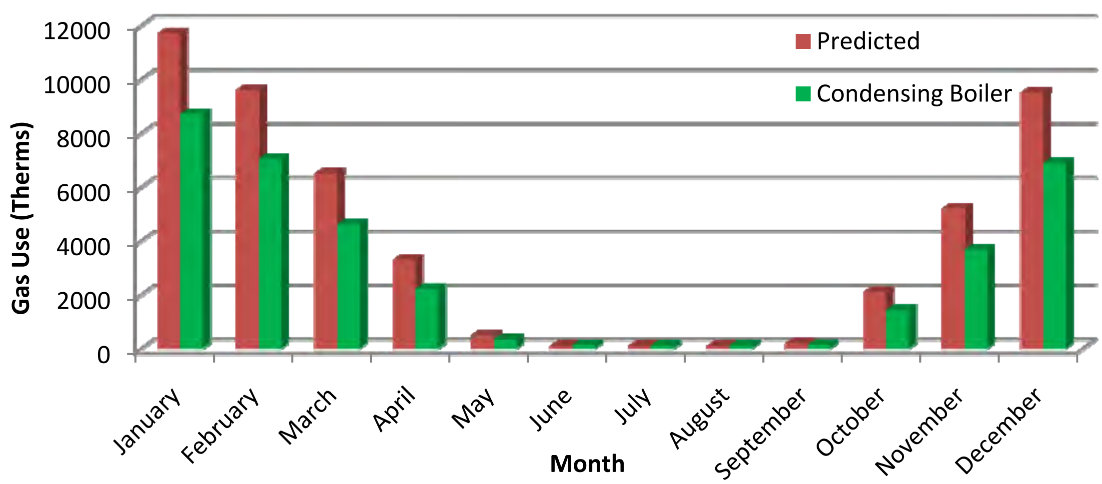
Currently, the heating system utilizes two (2) gas-fired Weil McLain cast iron boilers, each with an input rating of 2,396 MBH. A hot water gross I=B=R rating of 1,904 MBH gives each of these boilers a combustion efficiency of 79%.

CDM recommends replacing these boilers with a system of high-efficiency, condensing boilers.

CDM anticipates that two (2) 2,500 MBH input high-efficiency condensing boilers should adequately heat the school.

Figure 4.2.2-4 compares current gas usage with predicted gas usage resulting from a switch to high-efficiency, condensing boilers. Condensing boilers are modeled with a full-load efficiency of 92% and return water temperature as low as 100°F in mild weather.

Figure 4.2.2-4: Dorothy Bullock School – Boiler Upgrade - Natural Gas Usage



Fiscal savings from such an upgrade are then identified in Table 4.2.2-1 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 boilers with condensing boilers should result in an operation and maintenance cost savings of $1,500 per year.

Table 4.2.2-1: Dorothy Bullock School Boiler Upgrade Payback	
Predicted Annual Savings (Therms)	13,513
Total Annual Savings	$18,513
Initial Capital Cost of Upgrade	$182,563
Incentives**	$5,000
Cost of Upgrade	$177,563
Simple Payback	**8.9**
Lifetime Energy Savings (24 years)*	$563,200
Annual Maintenance Cost Savings (AMCS)	$1,500
Annual Return on Investment (AROI)	7.10%
Internal Rate of Return (IRR)	13.07%
Net Present Value (NPV)	$288,759

*Assumes 2% yearly inflation on natural gas costs
**Incentives, per New Jersey Clean Energy Program, are $1.00 per MBH

Currently, HVAC units at the Dorothy Bullock School are controlled by a hybrid control system. This control system uses pneumatic actuators for valves and dampers. It is monitored and controlled by a Trane building management system, which is direct-digital control (DDC). The accuracy of pneumatic system controls tend to "wander" over time. Recalibration of the pneumatic system should be performed at least annually to improve the accuracy and efficiency of the HVAC system. The current system could be upgraded to full digital control. Upgrading to full digital control would include the removal of the pneumatic system allowing for the de-commissioning of the pneumatic system compressor. Replacing the pneumatic actuators with electric actuators would be more costly than the savings realized from removing the compressor. The maintenance staff has most likely been trained to diagnose and fix problems that arise with operating a pneumatic system. As a result of the anticipated longer payback, this recommendation will not be evaluated further.

During the audit, CDM noted that there was no outside air louvers located in the boiler room. A supply fan was seen that may provide sufficient combustion air to the boiler room. Outdoor combustion air should be provided to the boiler room according to Section 304 of the New Jersey Fuel Gas Code. Having the appropriate proportion of fuel and combustion air can increase the efficiency of the boiler and generate savings for the District.

All major equipment noted during CDM's on site audit is listed in Table 4.2.2-2 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 4.2.2-2 Dorothy Bullock School HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler (x2)	Boiler Room	Entire School	Weil McLain	888	79%	18	24
Air Cooled Liquid Chiller	Roof	Entire School	Trane	CGACD124RMN623FGHW7	Unknown	Unknown	20
Hot Water Unit Heater	Receiving	Receiving	Sterling	HS-125A	87%	Unknown	20
Make-Up Air Unit	Roof	Kitchen	Industrial Air Systems	GHLIAC 35 HW 1-6	80%	Unknown (Old)	20
Air Cooled Condensing Unit (ACCU) (x2)	Roof	Kitchen	Brown	Unknown	Unknown	Unknown (Old)	20
ACCU	Roof	Kitchen	Brown	Unknown	Unknown	Unknown (Old)	20
Large Cabinet Fans (x6)	Gym	Gym	Unknown	Unknown	Unknown	Unknown	25
Large Cabinet Fans (x6)	Cafeteria	Cafeteria	Unknown	Unknown	Unknown	Unknown	25

CDM also creates an inventory of observed domestic water heaters. This will attempt to inform the District 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 4.2.2-3 below.

Table 4.2.2-3 Dorothy Bullock School Domestic Water Heaters					
Location	Make	Storage Capacity (Gallons)	Type	Heating Capacity	Estimated Age (Years)
Boiler Room	A.O. Smith	200	Gas	600 MBH	Unknown

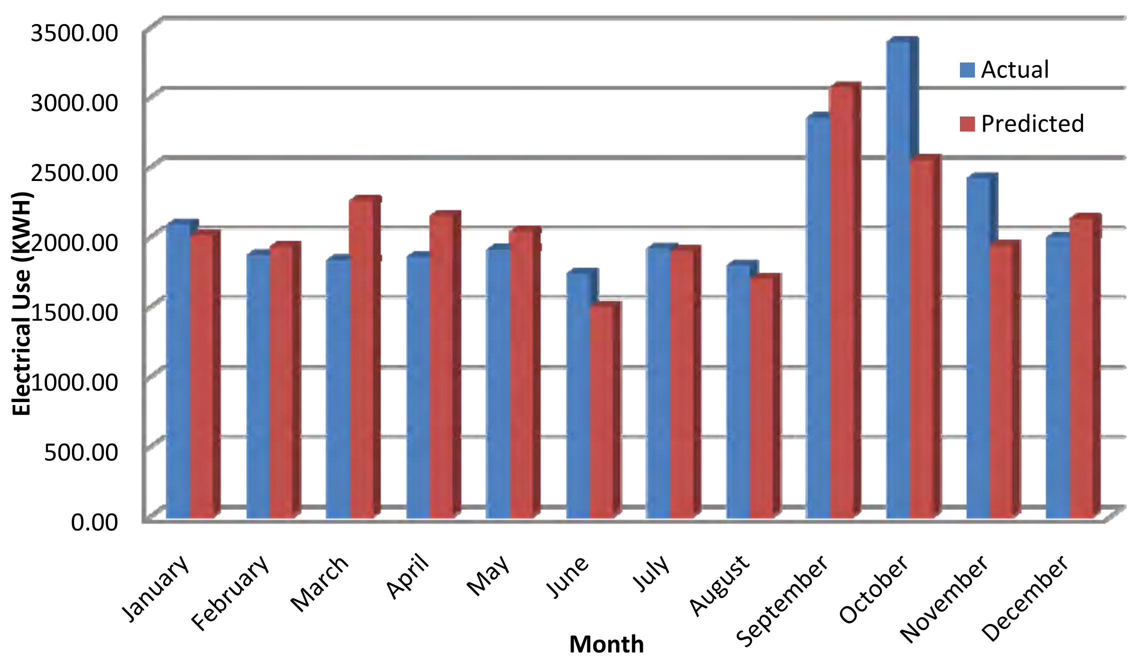
An inventory of observed compressors may be seen as Table 4.2.2-4 below.

Table 4.2.2-4 Dorothy Bullock School Compressors				
Location	Make	Receiver Capacity (Gallons)	Motor (HP)	Observed Condition
Boiler Room	Honeywell	Unknown	2 2	Good Good

4.2.3 Elsmere School

A model of the Elsmere School was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity and natural gas bills from January, 2008 through November, 2009. Figure 4.2.3-1 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 two years, to yield an approximate average usage during the month of June.

Figure 4.2.3-1: Elsmere School Electricity Usage



The high usage in September and October may be due to the commencement of school. Only one electric usage was entered for September and October while the rest of the months excluding December had two entries. If more data was supplied for these two months the trend may be more gradual. The annual predicted electricity usage was still within 2% of the actual 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 4.2.3-2 presents this information to help the District visualize where CDM anticipates the electricity is ultimately being used.

Figure 4.2.3-2: Elsmere School Usage Breakdown

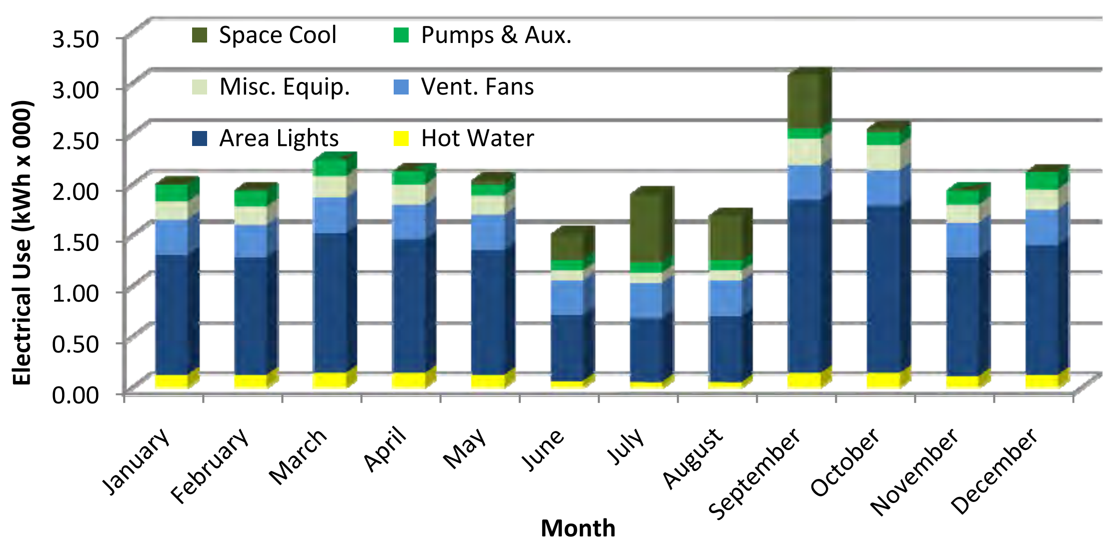
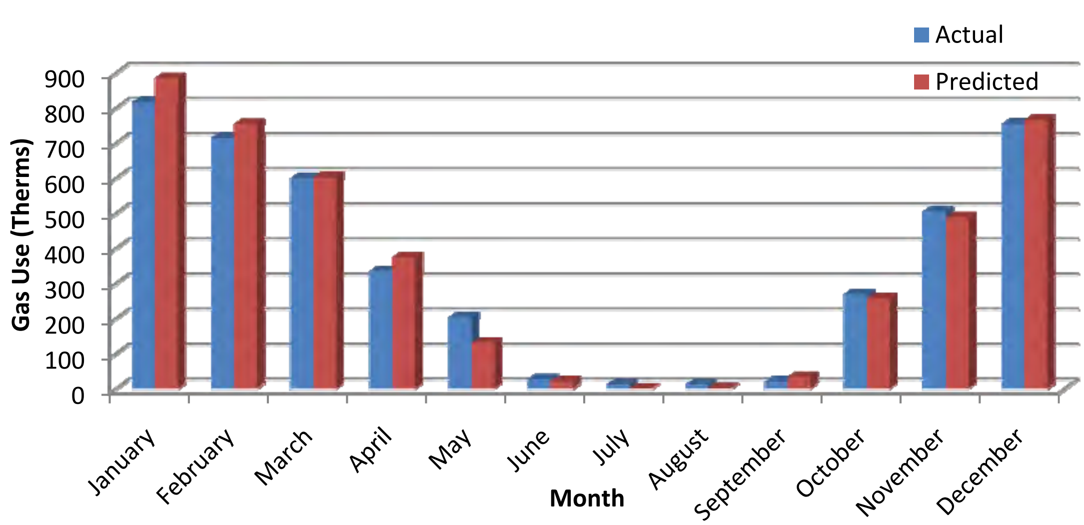


Figure 4.2.3-3 below compares actual natural gas usage to model-predicted natural gas use. The annual predicted gas usage was modeled within 1% of the actual usage.

Figure 4.2.3-3: Elsmere School Natural Gas Usage



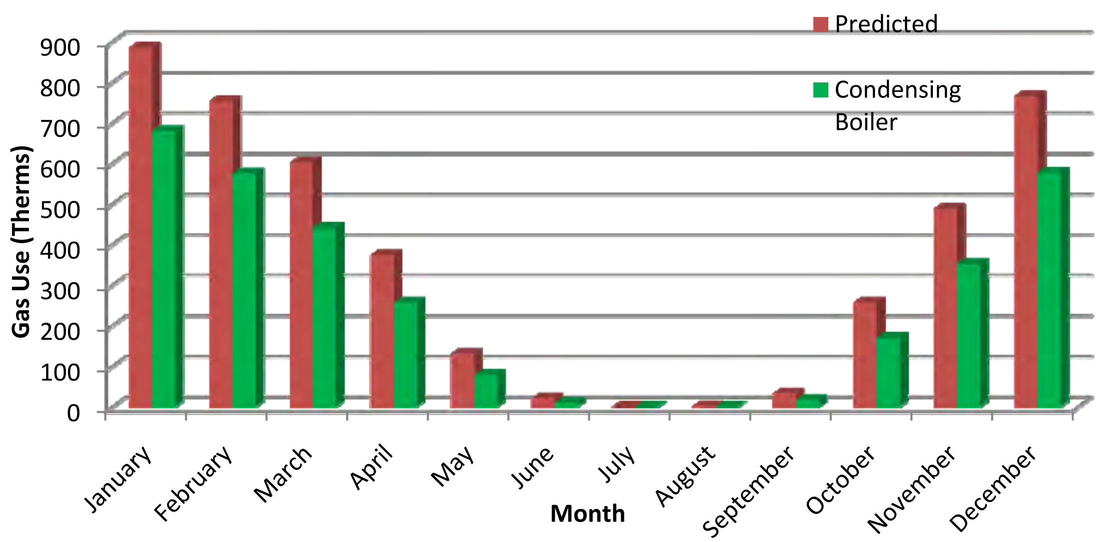
Currently, the heating system utilizes one (1) gas-fired Weil McLain cast iron boiler with a hot water gross I=B=R rating of 364 MBH. CDM conservatively estimates this boiler to be 80% efficient.

CDM recommends replacing this boiler with a high-efficiency, condensing boiler.

CDM anticipates that one (1) 399 MBH input high-efficiency condensing boiler should adequately heat the school.

Figure 4.2.3-4 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 92% and return water temperature as low as 100°F in mild weather.

Figure 4.2.3-4: Elsmere School – Boiler Upgrade - Natural Gas Usage



Fiscal savings from such an upgrade are then identified in Table 4.2.3-1 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 with one boiler will typically cost around $1,500 per year for regular preventative maintenance, whereas a condensing boiler system with one boiler would cost around $1,000 per year. Therefore, replacing the existing boiler with a condensing boiler should result in an operation and maintenance cost savings of $500 per year.

Table 4.2.3-1: Elsmere School Boiler Upgrade Payback	
Predicted Annual Savings (Therms)	1,155
Total Annual Savings	$1,629
Initial Capital Cost of Upgrade	$42,981
Incentives**	$698
Cost of Upgrade	$42,283
Simple Payback	**19.9**
Lifetime Energy Savings (24 years)*	$49,557
Annual Maintenance Cost Savings (AMCS)	$500
Annual Return on Investment (AROI)	0.87%
Internal Rate of Return (IRR)	4.36%
Net Present Value (NPV)	$7,325

*Assumes 2% yearly inflation on natural gas costs
**Incentives, per New Jersey Clean Energy Program, are $1.75 per MBH

During the audit, CDM noted that there was a 24" x 12" combustion air louver located in the boiler room. Outdoor combustion air should be provided to the boiler room according to Section 304 of the New Jersey Fuel Gas Code. Having the appropriate proportion of fuel and combustion air can increase the efficiency of the boiler and generate savings for the District.

All major equipment noted during CDM's on site audit is listed in Table 4.2.3-2 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 4.2.3-2 Elsmere School HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Boiler Room	Entire School	Weil McLain	Unknown	80%	24	24
Air Cooled Condensing Unit (ACCU)	Outside	Northwest Classroom	McQuay	CLJ36-1C	12 SEER	Unknown (Good Condition)	20
ACCU	Outside	Southwest Classroom	McQuay	CLJ36-1C	12 SEER	Unknown (Good Condition)	20
ACU (thru wall)	East Wall	Northeast Classroom	Whirlpool	Unknown	Unknown	Unknown	15
ACU (thru wall)	East Wall	Southeast Classroom	General Electric	AGM18D1G1	10.7 EER	4	15

Table 4.2.3-2 Elsmere School HVAC Equipment Service Lives							
ACU (thru wall)	North Wall	North Wing	Unknown	Unknown	Unknown	Unknown	15

CDM also takes an inventory of the observed domestic water heaters. This will inform the District 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 4.2.3-3 below.

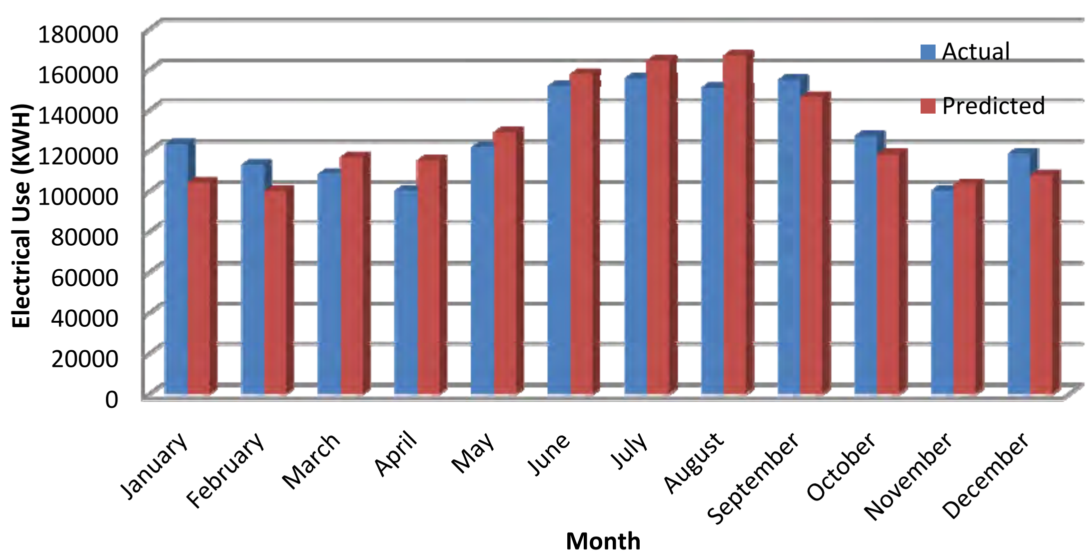
Table 4.2.3-3 Elsmere School Domestic Water Heaters

Location	Make	Storage Capacity (Gallons)	Type	Heating Capacity	Estimated Age (Years)
Boiler Room	Bradford White	30	Electric	4.5 KW	Unknown (Good Condition)

4.2.4 Glassboro High School

A model of the Glassboro High School was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity and natural gas bills from January, 2008 through November, 2009. Figure 4.2.4-1 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 two years, to yield an approximate average usage during the month of June.

Figure 4.2.4-1: Glassboro High School Electricity Usage



The annual predicted electricity usage was within 1% of the actual 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 4.2.4-2 presents this information to help the District visualize where CDM anticipates the electricity is ultimately being used.

Figure 4.2.4-2: Glassboro High School Usage Breakdown

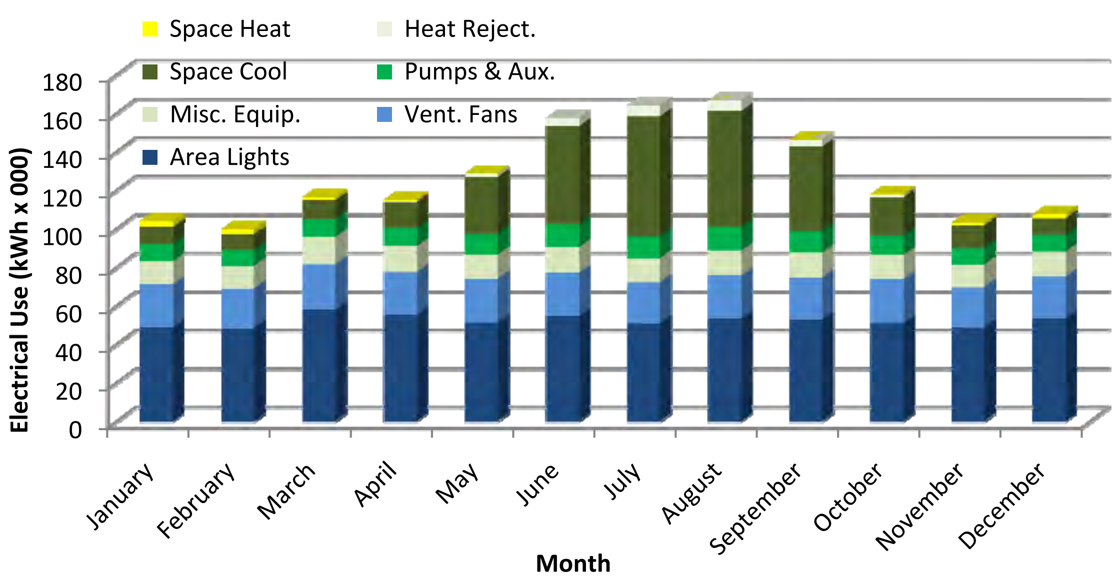


Figure 4.2.4-3 below compares actual electrical demand to model-predicted electrical demand.

Figure 4.2.4-3: Glassboro High School Electric Demand

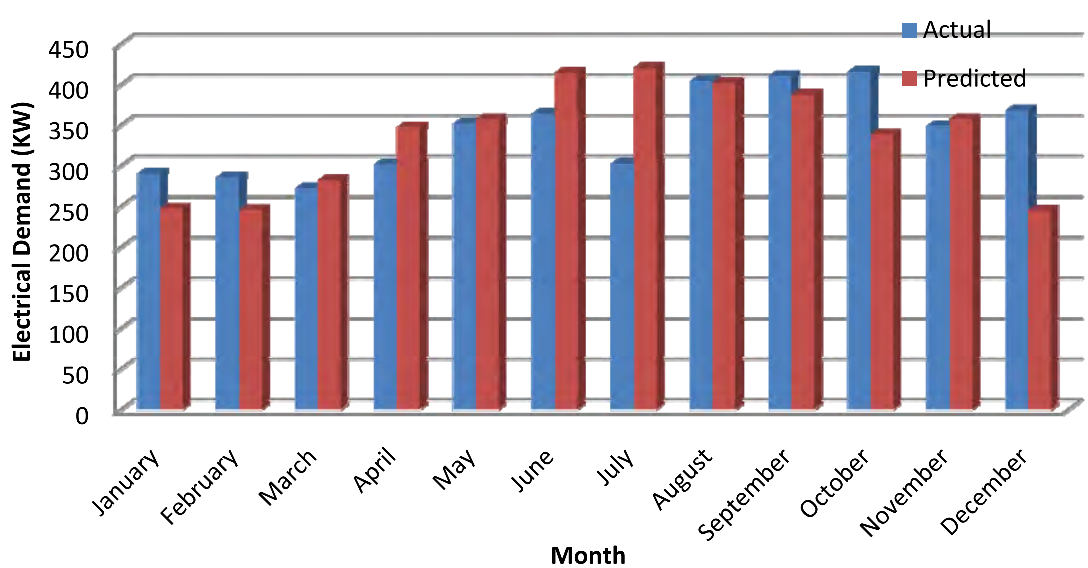
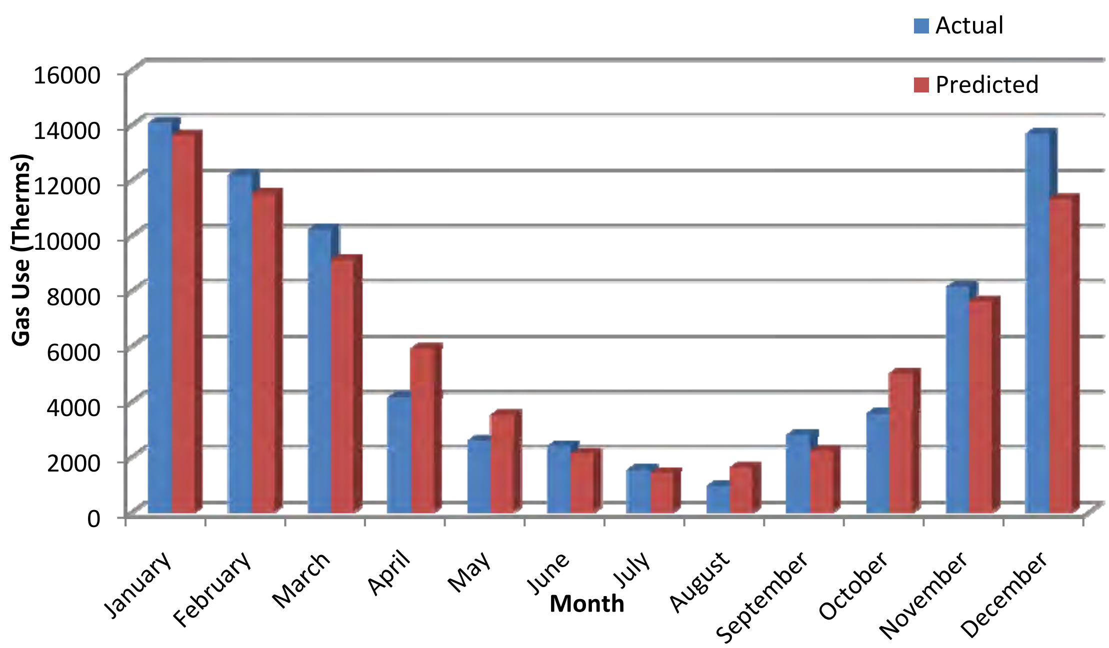


Figure 4.2.4-4 below compares actual natural gas usage to model-predicted natural gas use. The annual predicted gas usage was modeled within 2% of the actual usage.

Figure 4.2.4-4: Glassboro High School Natural Gas Usage



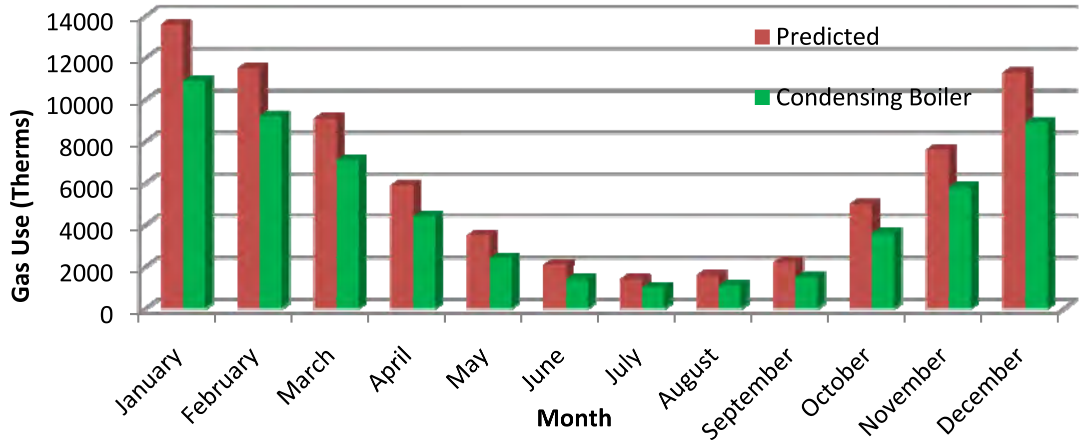
Currently, the heating system utilizes two (2) gas-fired Cleaver Brooks Firetube boilers, each with an input rating of 5,230 MBH. A hot water gross I=B=R output rating of 4,184 MBH gives each of these boilers a combustion efficiency of 80%. The inspection sheets state that the boilers are from 1965.

CDM recommends replacing these boilers with a system of high-efficiency, condensing boilers.

CDM anticipates that two (2) 4,500 MBH input high-efficiency condensing boilers should adequately heat the school.

Figure 4.2.4-5 compares current gas usage with predicted gas usage resulting from a switch to high-efficiency, condensing boilers. Condensing boilers are modeled with a full-load efficiency of 92% and return water temperature as low as 100°F in mild weather.

Figure 4.2.4-5: Glassboro High School – Boiler Upgrade - Natural Gas Usage



Fiscal savings from such an upgrade are then identified in Table 4.2.4-1 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 boilers with condensing boilers should result in an operation and maintenance cost savings of $1,500 per year.

Table 4.2.4-1: Glassboro High School Boiler Upgrade Payback	
Predicted Annual Savings (Therms)	17,604
Total Annual Savings	$24,822
Initial Capital Cost of Upgrade	$193,718
Incentives**	$
Cost of Upgrade	$193,718
Simple Payback	**7.4**
Lifetime Energy Savings (24 years)*	$755,131
Annual Maintenance Cost Savings (AMCS)	$1,500
Annual Return on Investment (AROI)	9.42%
Internal Rate of Return (IRR)	15.76%
Net Present Value (NPV)	$419,610

*Assumes 2% yearly inflation on natural gas costs
**Incentives for boilers exceeding 4,000 MBH are granted on a case by case basis, per New Jersey Clean Energy Program

Currently, HVAC units at the Glassboro High School are controlled by a pneumatic system. Unless recalibrated at least annually, the accuracy of pneumatic system controls tends to "wander" over time. Thus, a switch to full digital control should be considered for consistency and maintenance purposes. In addition, removal of a pneumatic system will allow for the de-commissioning of the pneumatic system compressor. Consolidating control of these units into one central building management system (BMS) with direct digital controls (DDC) may provide significant energy savings. A consolidated DDC building management system typically tends to offer a 10% energy savings over independent unit controls. A centralized building management system can incorporate real time energy monitoring for all HVAC systems, allowing the District to see exactly how much energy is being used to heat and/or cool the building at any time throughout the year.

Table 4.2.4-2 displays a projected building management system payback, assuming a building management system with 131 points of control. Electricity savings are estimated to be 10% of the total ventilation, pump, and space cooling electricity usage. To estimate operation and maintenance savings, CDM has assumed that the existing air compressors serving the pneumatic controls systems (as noted in Table 4.2.4-5-) run approximately one third of the time (or 2,920 hours per year). The electricity costs associated with running these motors constitute CDM's assumed maintenance savings. While actual maintenance savings will likely be higher because all controls are consolidated to one central program, CDM asserts that the measurable cost associated with compressor run times is a conservative estimate. Compressor motors are assumed to be 84% efficient.

Table 4.2.4-2: Glassboro High School DDC BMS Payback	
Predicted Annual Savings (Therms)	7,613
Annual Savings (Gas)	$10,734
Predicted Annual Savings (kWh)	71,420
Annual Savings (Electricity)	$9,285
Total Annual Savings	$20,019
Initial Capital Cost of Upgrade	$65,501
Incentives	$0
Cost of Upgrade	$65,501
Simple Payback	**3.1**
Lifetime Energy Savings (15 years)*	$358,318
Annual Maintenance Cost Savings (AMCS)	**$792**
Annual Return on Investment (AROI)	25.11%
Internal Rate of Return (IRR)	34.17%
Net Present Value (NPV)	$237,572

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

CDM was not able to locate any available grants or incentives for consolidating systems and switching to DDC. Despite this, however, this change still offers an attractive payback and is therefore recommended by CDM.

It was reported that the High School classroom unit ventilators manufactured by Trane are original to the construction of the building. Due to their age, the dampers are stuck in the five percent open range. The classrooms are continuously heated with outside air throughout the heating season. The district can make significant savings by not heating outside air when classrooms are unoccupied.

Based on good engineering practice, CDM has assumed that the unit ventilators are heating when the outside air temperature is below 60 degrees. CDM estimated that thirty classrooms are heated with 50 cfm of outside air. The months of June through August are assumed to have no heating. The annual savings from closing the damper to outside air when classrooms are unoccupied is $2,273. There are savings associated with the unit ventilator fan running less as well. CDM assumed that with functional dampers these fans will run forty five percent less of the time. The electricity savings from running fans less is $1,909.

During the audit, CDM noted that there were two (32" x 24" and 36" x 42") outside air dampers located in the boiler room. Outdoor combustion air should be provided to the boiler room according to Section 304 of the New Jersey Fuel Gas Code. Having the appropriate proportion of fuel and combustion air can increase the efficiency of the boiler and generate savings for the District.

All major equipment noted during CDM's on site audit is listed in Table 4.2.4-3 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. There were air handling units that CDM observed during the audit, but are not included in the table below due to limited data.

Table 4.2.4-3 Glassboro High School HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler (x2)	Boiler Room	Entire School	Cleaver Brooks	CB552-125	80%	Unknown	24
Liquid Chiller	Boiler Room	Entire School (n.i. C Wing	Trane	RTHC1C1AOHOE113F1LFVQU00	Unknown	11	20
Cooling Tower	Roof	Chiller	Marley	Unknown	89.5%	Unknown	20
Rooftop Unit (RTU) (x2)	Roof	Aux Gym	Trane	Unknown	Unknown	Unknown	15
RTU	Roof	C Wing	Trane	TFD120C30AAB	Unknown	10	15
RTU	Roof	Addition	Trane	SLHFC50ED545A69D900 1A0C0000K0MR0008600	Unknown	~7	15

Table 4.2.4-3 Glassboro High School HVAC Equipment Service Lives

RTU (x2)	Roof	A-1 Wing	Trane	TSC048A3R0A0ZD0B000000600	Unknown	6	15
ACCU	Roof	C Wing	Trane	TTB048C100A1	Unknown	10	20
ACCU (x2)	Roof	C Wing	Trane	TTB030C100A1	Unknown	10	20
ACU (thru wall)	Northwest Wall	C105	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Northwest Wall	C106	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Northeast Wall	C110	Carrier	Unknown	Unknown	Unknown	15
ACU (thru wall)	Southeast Wall	102	Quiet Kool	Unknown	Unknown	Unknown	15

CDM also takes an inventory of the observed domestic water heaters. This will inform the District 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 4.2.4-4 below.

Table 4.2.4-4 Glassboro High School Domestic Water Heaters

Location	Make	Storage Capacity (Gallons)	Type	Heating Capacity	Estimated Age (Years)
Boiler Room	Paloma	Unknown	Gas	179 MBH	Unknown
Boiler Room	Paloma	Unknown	Gas	179 MBH	Unknown
Boiler Room	Bradford White	40	Electric	4.5 KW	Unknown (Good Condition)

An inventory of observed compressors may be seen as Table 4.2.4-5 below.

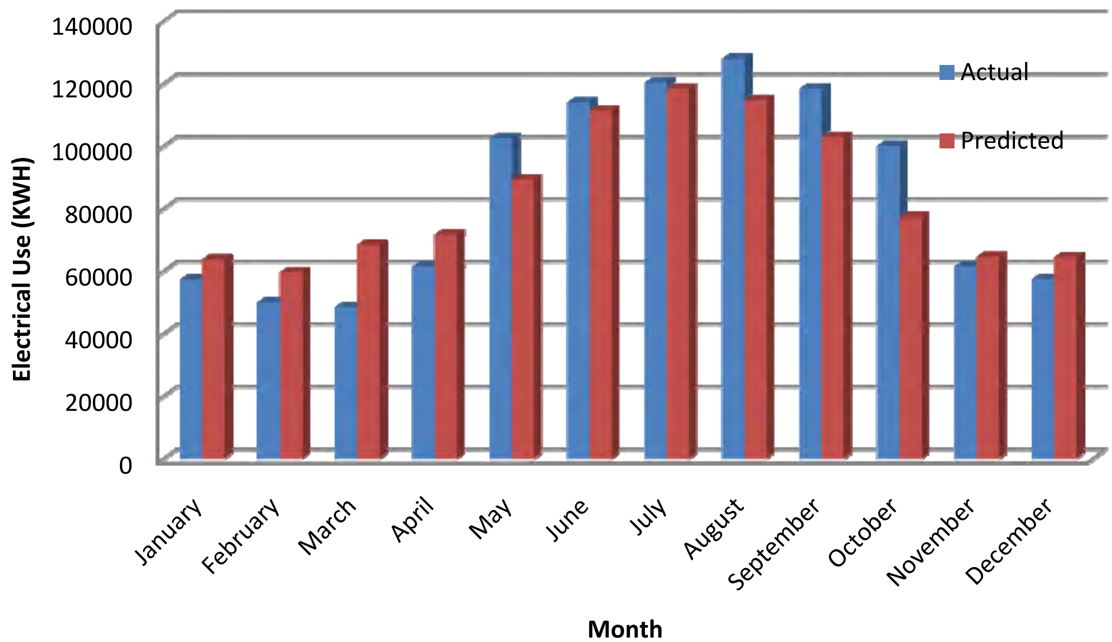
Table 4.2.4-5 Glassboro High School Compressors

Location	Make	Receiver Capacity (Gallons)	Motor (HP)	Observed Condition
Boiler Room	Wood Industries	Unknown	3.3	Good

4.2.5 Glassboro Intermediate School

A model of the Glassboro Intermediate School was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity and natural gas bills from January, 2008 through November, 2009. Figure 4.2.5-1 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 two years, to yield an approximate average usage during the month of June.

Figure 4.2.5-1: Glassboro Intermediate School Electricity Usage



The annual predicted electricity usage was modeled within 2% of the actual 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 4.2.5-2 presents this information to help the District visualize where CDM anticipates the electricity is ultimately being used.

Figure 4.2.5-2: Glassboro Intermediate School Usage Breakdown

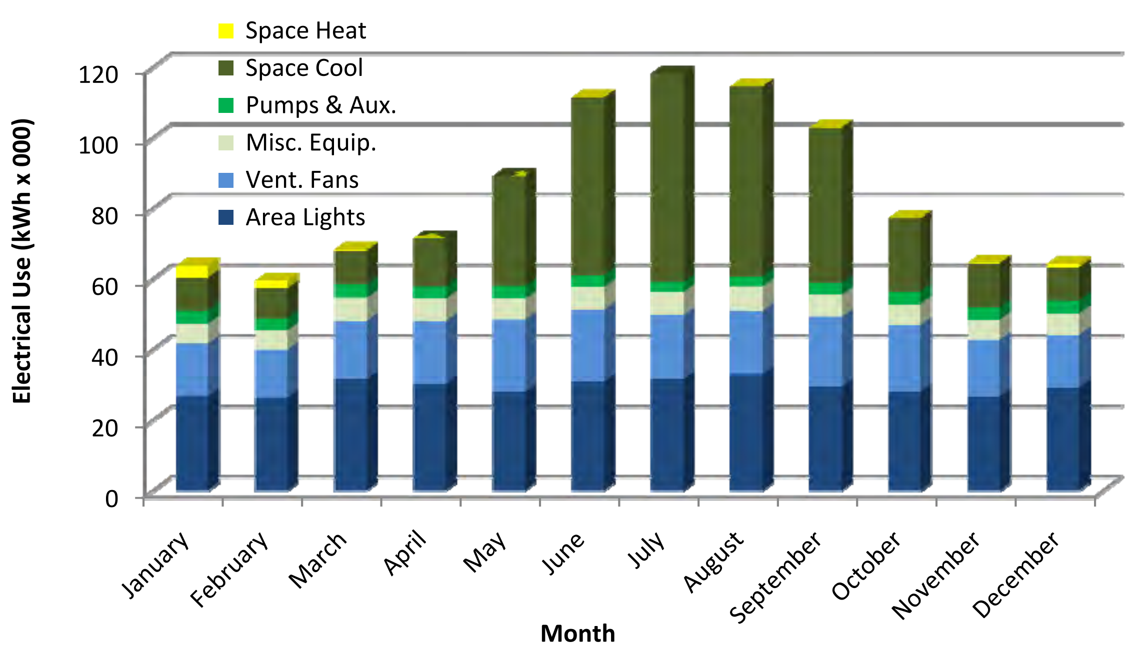
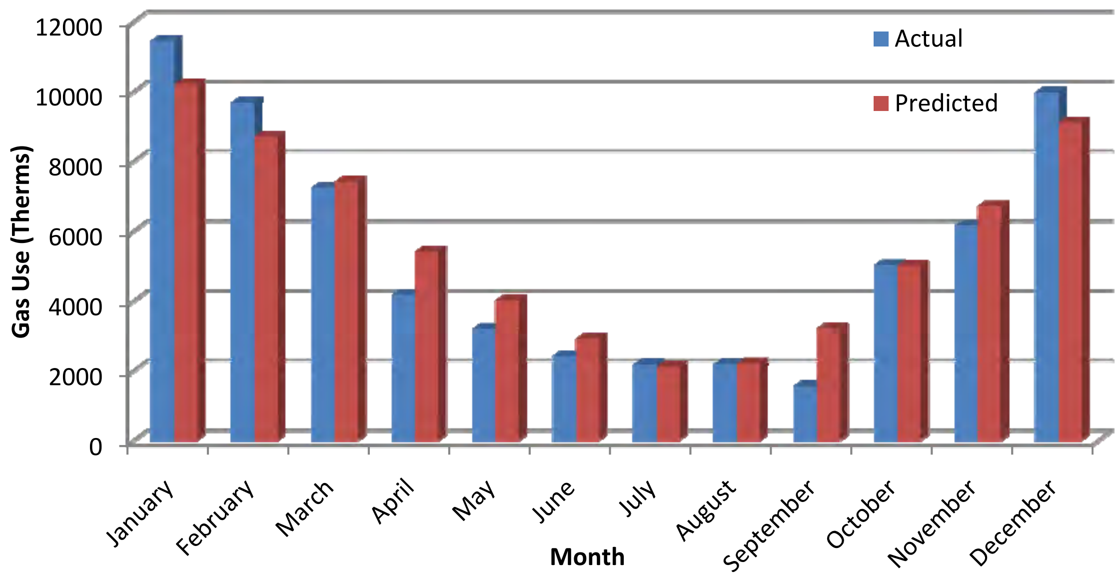


Figure 4.2.5-3 below compares actual natural gas usage to model-predicted natural gas use. While some natural gas is used for domestic water heating and cooking, the boilers account for the majority of the natural gas usage at the school. The annual predicted gas usage was modeled within 3% of the actual usage.

Figure 4.2.5-3: Glassboro Intermediate School Natural Gas Usage



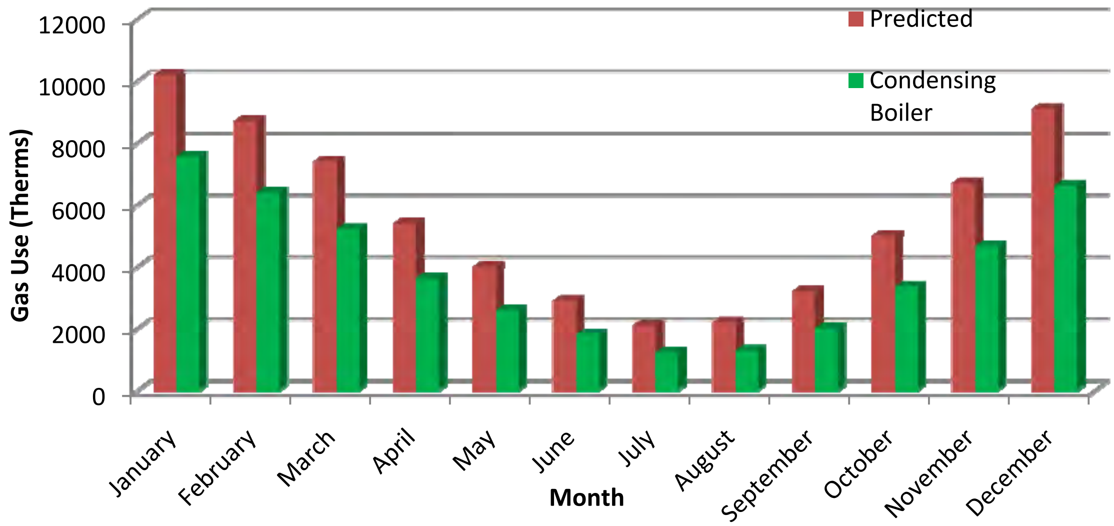
Currently, the heating system utilizes two (2) gas-fired Smith cast iron hot water boilers, each with an input rating of 6,341 MBH. A gross I=B=R output rating of 5,014 MBH gives each of these boilers a combustion efficiency of 79%.

The boilers currently operating at the Intermediate School are only 6-7 years old. It may not be financially feasible to replace these boilers immediately. When the current boilers begin approaching their useful life the District should investigate a boiler system upgrade. CDM completed a boiler upgrade analysis below to allow the District to examine the approximate savings.

CDM anticipates that three (3) 4,000 MBH input high-efficiency condensing boilers should adequately heat the school.

Figure 4.2.5-4 compares current gas usage with predicted gas usage resulting from a switch to high-efficiency, condensing boilers. Condensing boilers are modeled with a full-load efficiency of 92% and return water temperature as low as 100°F in mild weather.

Figure 4.2.5-4: Glassboro Intermediate School – Boiler Upgrade - Natural Gas Usage



Fiscal savings from such an upgrade are then identified in Table 4.2.5-1 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 with three boilers would cost around $3,000 per year. Therefore, replacing the existing boilers with condensing boilers should result in an operation and maintenance cost savings of $500 per year.

Table 4.2.5-1: Glassboro Intermediate School Boiler Upgrade Payback	
Predicted Annual Savings (Therms)	20,524
Total Annual Savings	$29,144
Initial Capital Cost of Upgrade	$245,670
Incentives**	$12,000
Cost of Upgrade	$233,670
Simple Payback	**7.9**
Lifetime Energy Savings (24 years)*	$886,615
Annual Maintenance Cost Savings (AMCS)	$500
Annual Return on Investment (AROI)	8.52%
Internal Rate of Return (IRR)	14.73%
Net Present Value (NPV)	$457,064

*Assumes 2% yearly inflation on natural gas costs
**Incentives, per New Jersey Clean Energy Program, are $1.00 per MBH

Currently, HVAC units at the Glassboro Intermediate School are controlled by a pneumatic system. Unless recalibrated at least annually, the accuracy of pneumatic system controls tends to "wander" over time. Thus, a switch to full digital control should be considered for consistency and maintenance purposes. In addition, removal of a pneumatic system will allow for the de-commissioning of the pneumatic system compressor. Consolidating control of these units into one central building management system (BMS) with direct digital controls (DDC) may provide significant energy savings. A consolidated DDC building management system typically tends to offer a 10% energy savings over independent unit controls. A centralized building management system can incorporate real time energy monitoring for all HVAC systems, allowing the District to see exactly how much energy is being used to heat and/or cool the building at any time throughout the year.

Table 4.2.5-2 displays a projected building management system payback, assuming a building management system with 70 points of control. Electricity savings are estimated to be 10% of the total ventilation, pump, and space cooling electricity usage. To estimate operation and maintenance savings, CDM has assumed that the existing air compressors serving the pneumatic controls systems (as noted in Table 4.2.5-5) run approximately one third of the time (or 2,920 hours per year). The electricity costs associated with running these motors constitute CDM's assumed maintenance savings. While actual maintenance savings will likely be higher because all controls are consolidated to one central program, CDM asserts that the measurable cost associated with compressor run times is a conservative estimate. Compressor motors are assumed to be 84% efficient.

Table 4.2.5-2: Glassboro Intermediate School DDC BMS Payback	
Predicted Annual Savings (Therms)	6,515
Annual Savings (Gas)	$9,251
Predicted Annual Savings (kWh)	57,240
Annual Savings (Electricity)	$8,014
Total Annual Savings	$19,736
Initial Capital Cost of Upgrade	$34,886
Incentives	$0
Cost of Upgrade	$34,886
Simple Payback	**1.6**
Lifetime Energy Savings (15 years)*	$309,033
Annual Maintenance Cost Savings (AMCS)	**$2,560**
Annual Return on Investment (AROI)	57.24%
Internal Rate of Return (IRR)	66.87%
Net Present Value (NPV)	$289,813

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

CDM was not able to locate any available grants or incentives for consolidating systems and switching to DDC. Despite this, however, this change still offers an attractive payback and is therefore recommended by CDM.

During the audit, CDM noted that there were two (108” x 48” and 36” x 102”) outside air dampers located in the boiler room. Outdoor combustion air should be provided to the boiler room according to Section 304 of the New Jersey Fuel Gas Code. Having the appropriate proportion of fuel and combustion air can increase the efficiency of the boiler and generate savings for the District.

All major equipment noted during CDM’s on site audit is listed in Table 4.2.5-3 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.

Table 4.2.5-3 Glassboro Intermediate School HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler (x2)	Boiler Room	Entire School	Smith	4500A-15	79%	~6	24
Hot Water Unit Heater (x2)	Boiler Room	Boiler Room	Trane	UHSA137S8EAA1T00000BE	Unknown	Unknown	20
Air Conditioning RTU-3	3rd Floor Roof	Science Lab (223)	Trane	TSC060A3R0A13 D2B000000600A	13 SEER	6	15
Air Conditioning RTU-4	3rd Floor Roof	Science Lab (231)	Trane	TSC092A3R0A0W D0B000000600C	11.2 EER	6	15
Air Conditioning RTU-2	3rd Floor Roof	Science Lab (224)	Trane	TSC072A3R0A0U D0B000000600	11.2 EER	6	15
RTU-6	3rd Floor Roof	Gym	Trane	TCD210C30AEA	Unknown	6	15
RTU-5	3rd Floor Roof	Gym	Trane	TCD210C30AEA	Unknown	6	15
Air Conditioning RTU-1	2nd Floor Roof	Orchestra Room	Trane	TSC120A3R0A10 D0B000000600	11.3 EER	6	15
Heat Recovery Unit (HRU) -2	3rd Floor Roof	Boys Locker Room (147)	Innovent	E-5000-1A-2000-AC-3-A	Unknown	6	25

Table 4.2.5-3 Glassboro Intermediate School HVAC Equipment Service Lives

HRU -1	2nd Floor Roof	Girls Locker Room (138)	Innovent	E-5000-1A-2000-AC-3-A	Unknown	6	25
ACU (thru wall)	West Courtyard Wall	211	Unknown	Unknown	Unknown	Unknown	15

CDM also takes an inventory of the observed domestic water heaters. This will inform the District 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 4.2.5-4 below.

Table 4.2.5-4 Glassboro Intermediate School Domestic Water Heaters

Location	Make	Storage Capacity (Gallons)	Type	Heating Capacity	Estimated Age (Years)
Boiler Room	A.O. Smith	74	Gas	76 MBH	Unknown

An inventory of observed compressors may be seen as Table 4.2.5-5 below.

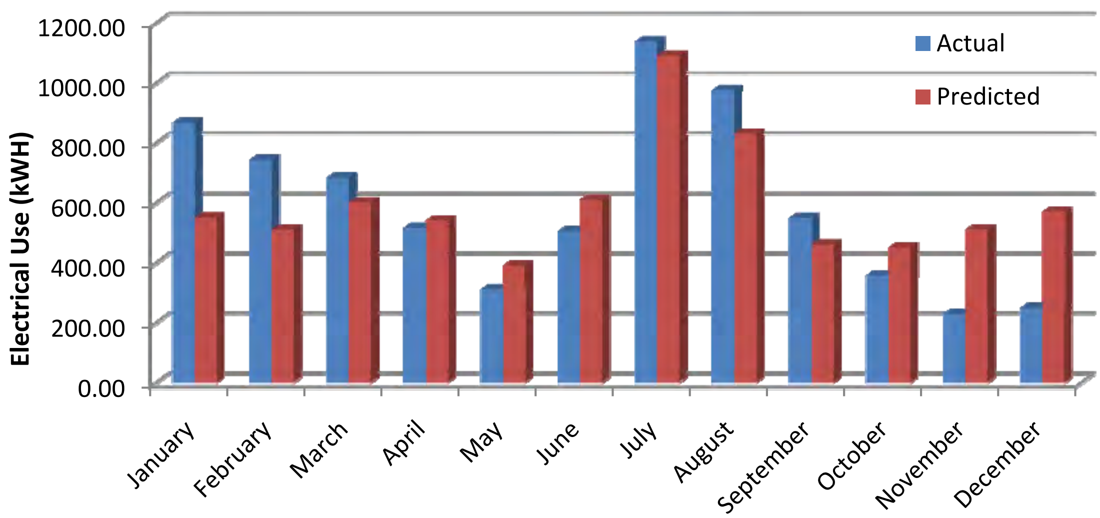
Table 4.2.5-5 Glassboro Intermediate School Compressors

Location	Make	Receiver Capacity (Gallons)	Motor (HP)	Observed Condition
Boiler Room	J.L. Lawson	80	5	Aging
			5	Aging

4.2.6 Glassboro Intermediate School Annex

A model of the Glassboro Intermediate School Annex was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity and natural gas bills from January, 2008 through November, 2009. Figure 4.2.6-1 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 two years, to yield an approximate average usage during the month of June.

Figure 4.2.6-1: Glassboro Intermediate School Annex Electricity Usage



The high electric usage in July and August is due to the 2008 year. In 2008 these two months had nearly double the usage they did in 2009. CDM expects this to be an exception, not a trend. The annual predicted electricity usage was within 1% of the actual 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 4.2.6-2 presents this information to help the District visualize where CDM anticipates the electricity is ultimately being used.

Figure 4.2.6-2: Glassboro Intermediate School Annex Usage Breakdown

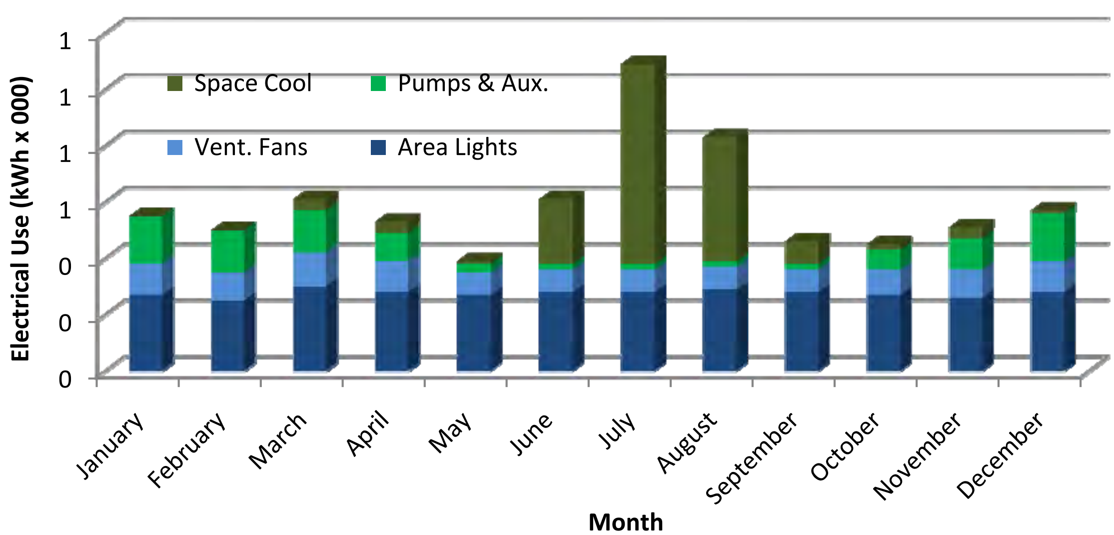
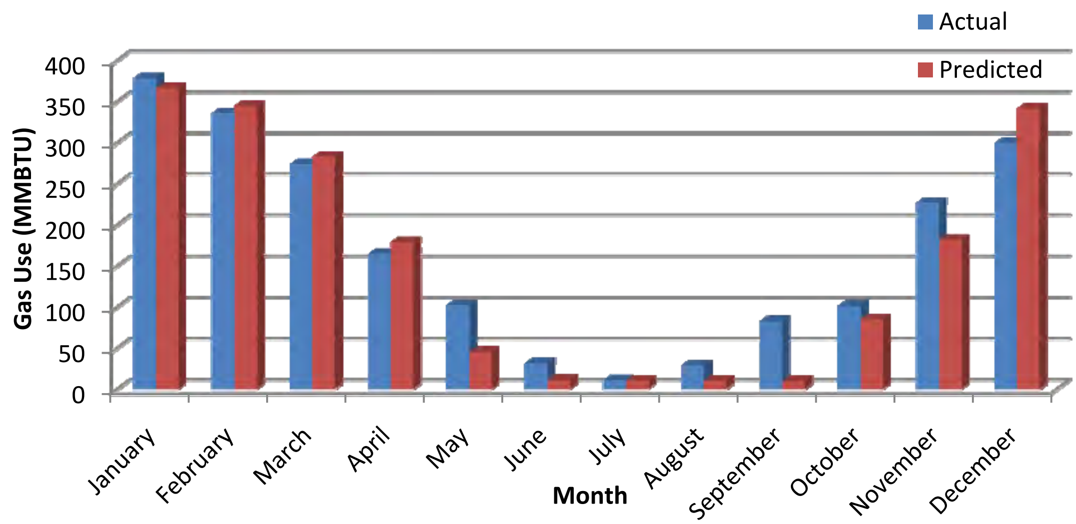


Figure 4.2.6-3 below compares actual natural gas usage to model-predicted natural gas use. While some natural gas is used for domestic water heating the boilers account for the majority of the natural gas usage at the school. The annual predicted gas usage was modeled within 9% of the actual usage.

Figure 4.2.6-3: Glassboro Intermediate School Annex Natural Gas Usage



The existing HVAC equipment appeared to be in good condition and did not warrant immediate replacement.

Outdoor combustion air should be provided to the boiler room according to Section 304 of the New Jersey Fuel Gas Code. Having the appropriate proportion of fuel and combustion air can increase the efficiency of the boiler and generate savings for the District.

All major equipment noted during CDM's on site audit is listed in Table 4.2.6-1 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. CDM did not have access to the roof at the time of the audit. Equipment data was taken from drawings that were supplied.

Table 4.2.6-1 Glassboro Intermediate School Annex HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler (x2)	Boiler Room	Entire School	Aerco	KC-1000	Unknown	7	24
*ACCU-1	Roof	Art Room	York	HIRA048506	Unknown	Unknown	20
*ACCU-2	Roof	Tech Lab	York	HIRA048506	Unknown	Unknown	20

Table 4.2.6-1 Glassboro Intermediate School Annex HVAC Equipment Service Lives							
*ACCU-3	Roof	Tech Lab	York	HIRA048506	Unknown	Unknown	20
*ACCU-4	Roof	Family	York	HIRA048506	Unknown	Unknown	20
*ACCU-5	Roof	Family	York	HIRA048506	Unknown	Unknown	20
*ACCU-6	Roof	Special Education	York	HIRA048506	Unknown	Unknown	20
*ACCU-1	Roof	Special Education	York	HIRA048506	Unknown	Unknown	20

* CDM did not have access to the roof at the time of the audit. Equipment data was taken from drawings that were supplied.

CDM also takes an inventory of the observed domestic water heaters. This will inform the District 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 4.2.6-2 below.

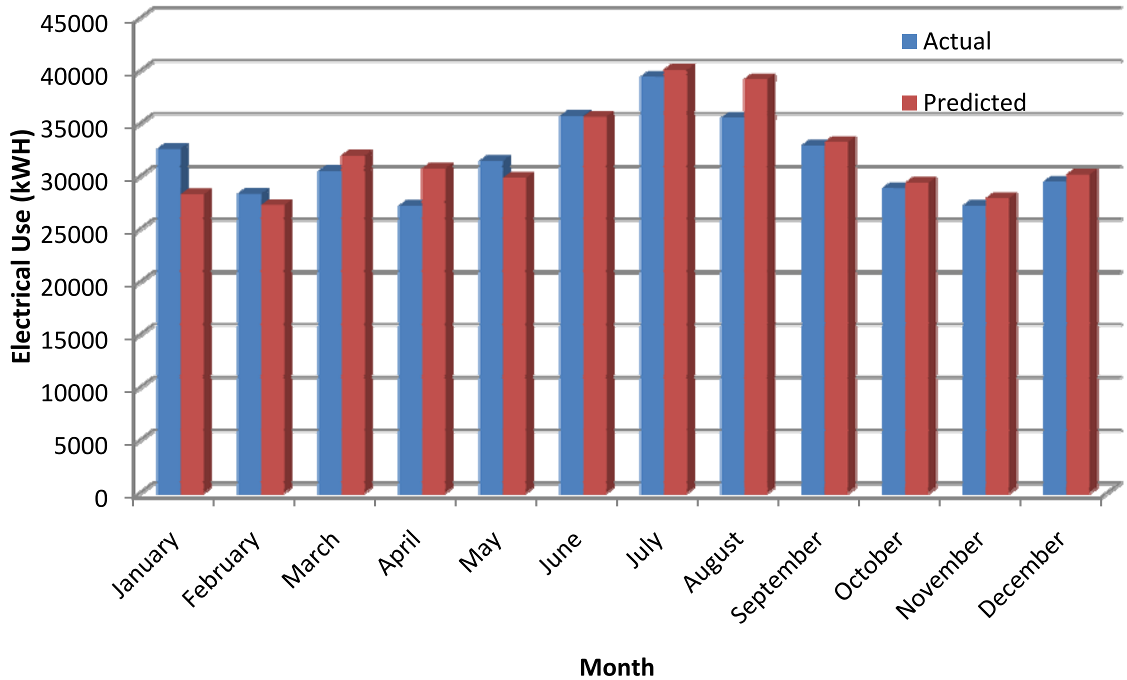
Table 4.2.6-2 Glassboro Intermediate School Annex Domestic Water Heaters

Location	Make	Storage Capacity (Gallons)	Type	Heating Capacity	Estimated Age (Years)
Boiler Room	A.O. Smith	71	Gas	120 MBH	6

4.2.7 J. Harvey Rodgers School

A model of the J. Harvey Rodgers School was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity and natural gas bills from January, 2008 through November, 2009. Figure 4.2.7-1 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 two years, to yield an approximate average usage during the month of June.

Figure 4.2.7-1: J. Harvey Rodgers School Electricity Usage



The annual predicted electricity usage was modeled within 2% of the actual 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 4.2.7-2 presents this information to help the District visualize where CDM anticipates the electricity is ultimately being used.

Figure 4.2.7-2: J. Harvey Rodgers School Usage Breakdown

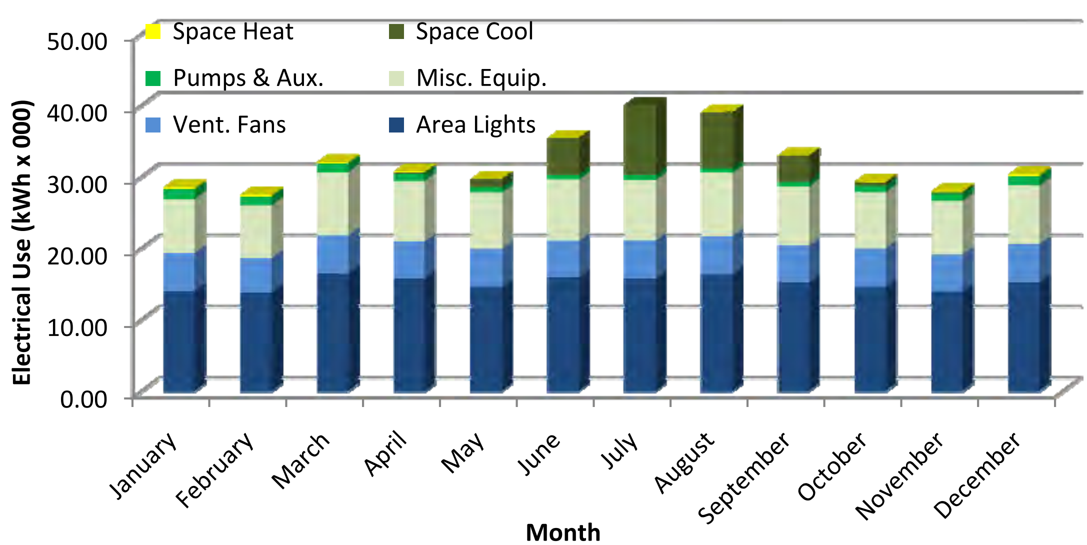
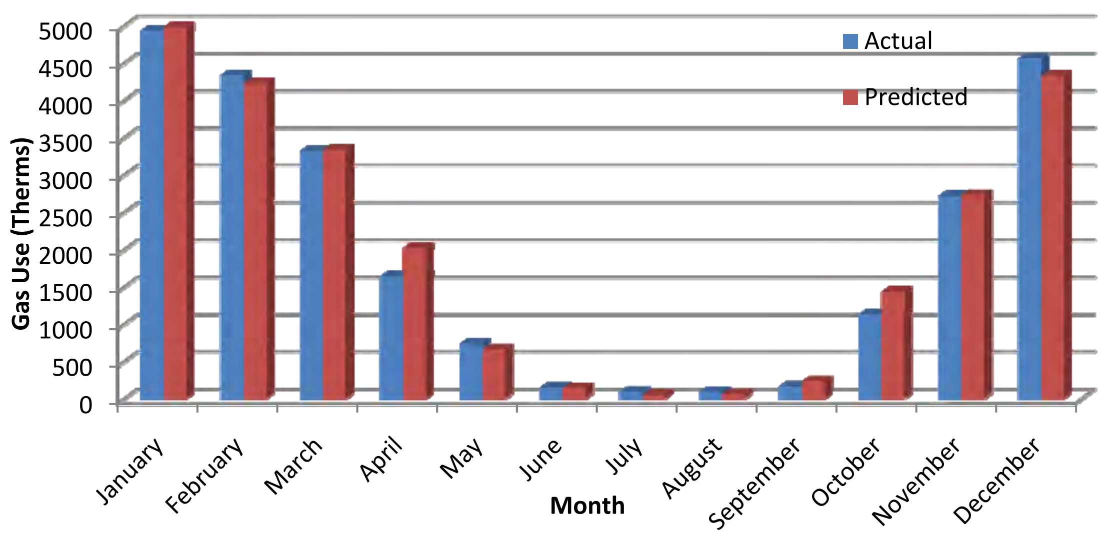


Figure 4.2.7-3 below compares actual natural gas usage to model-predicted natural gas use. While some natural gas is used for domestic water heating and cooking, the boilers account for the majority of the natural gas usage at the school. The annual predicted gas usage was modeled within 2% of the actual usage.

Figure 4.2.7-3: J. Harvey Rodgers School Natural Gas Usage



Currently, HVAC units at the J. Harvey Rodgers School are controlled by a pneumatic system. Unless recalibrated at least annually, the accuracy of pneumatic system controls tends to "wander" over time. Thus, a switch to full digital control should be considered for consistency and maintenance purposes. In addition, removal of a pneumatic system will allow for the de-commissioning of the pneumatic system compressor. Consolidating control of these units into one central building management system (BMS) with direct digital controls (DDC) may provide significant energy savings. A consolidated DDC building management system typically tends to offer a 10% energy savings over independent unit controls. A centralized building management system can incorporate real time energy monitoring for all HVAC systems, allowing the District to see exactly how much energy is being used to heat and/or cool the building at any time throughout the year.

Table 4.2.7-1 displays a projected building management system payback, assuming a building management system with 45 points of control. Electricity savings are estimated to be 10% of the total ventilation, pump, and space cooling electricity usage. To estimate operation and maintenance savings, CDM has assumed that the existing air compressors serving the pneumatic controls systems (as noted in Table 4.2.7-4) run approximately one third of the time (or 2,920 hours per year). The electricity costs associated with running these motors constitute CDM's assumed maintenance savings. While actual maintenance savings will likely be higher because all controls are consolidated to one central program, CDM asserts that the measurable cost associated with compressor run times is a conservative estimate. Compressor motors are assumed to be 84% efficient.

Table 4.2.7-1: J. Harvey Rodgers School DDC BMS Payback	
Predicted Annual Savings (Therms)	2,423
Annual Savings (Gas)	$3,320
Predicted Annual Savings (kWh)	10,297
Annual Savings (Electricity)	$1,545
Total Annual Savings	$4,865
Initial Capital Cost of Upgrade	$22,535
Incentives	$0
Cost of Upgrade	$22,535
Simple Payback	**4.5**
Lifetime Energy Savings (15 years)*	$86,149
Annual Maintenance Cost Savings (AMCS)	**$137**
Annual Return on Investment (AROI)	15.53%
Internal Rate of Return (IRR)	23.79%
Net Present Value (NPV)	$50,310

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

CDM was not able to locate any available grants or incentives for consolidating systems and switching to DDC. Despite this, however, this change still offers an attractive payback and is therefore recommended by CDM.

Outdoor combustion air should be provided to both boiler rooms according to Section 304 of the New Jersey Fuel Gas Code. Having the appropriate proportion of fuel and combustion air can increase the efficiency of the boiler and generate savings for the District.

All major equipment noted during CDM's on site audit is listed in Table 4.2.7-2 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 4.2.7-2 J. Harvey Rodgers Elementary School HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler (x2)	B-Wing Boiler Room	B-Wing	Weil McLain	LBG-15	81%	20	24
Boiler (x2)	A-Wing Mechanical Room	A-Wing	Lochinvar	PBN0150	88%	10	24
ACCU	Roof	Nurses Office	Trane	TTP030D100A0	12 SEER	10	20

Table 4.2.7-2 J. Harvey Rodgers Elementary School HVAC Equipment Service Lives

ACCU	Roof	Hallway	Trane	TTP042D300A0	12 SEER	10	20
ACCU	Roof	Hallway	Trane	TTP042D300A0	12 SEER	10	20
ACCU	Roof	Library	Trane	TTP048D300A0	12 SEER	10	20
ACCU	Roof	Library	Trane	TTP048D300A0	12 SEER	10	20
ACCU	Roof	Main Office	Trane	TTP036D300A0	12 SEER	10	20
ACCU	Roof	Principals Office	Trane	TTP036D300A0	12 SEER	10	20
ACCU	Roof	All Purpose Room A	Trane	Unknown	Unknown	Unknown	20
ACCU	Roof	Technology Room	EMI	SHC36DE0000AA0A	Unknown	<15	20
ACCU	Roof	Unknown	Trane	2TTB3030A1000AA	13 SEER	1	20
ACCU	Courtyard	B-1	Lennox	HS29-048-9Y	11 SEER	Unknown	20
ACCU	Outside North Wall	A-6	Trane	TTA036D300A0	12 SEER	10	20
ACCU	Outside North Wall	A-8	Trane	TTA036D300A0	12 SEER	10	20
ACCU	Outside South Wall	A-10	Trane	TTA036D300A0	12 SEER	10	20
ACCU	Outside South Wall	A-9	Trane	TTA036D300A0	12 SEER	10	20
ACCU	Outside South Wall	A-7	Trane	TTA036D300A0	12 SEER	10	20
ACCU	Outside South Wall	A-5	Trane	TTA036D300A0	12 SEER	10	20
ACCU	Outside South Wall	A-4	Trane	TTP030D100A0	12 SEER	10	20
ACCU	Outside South Wall	A-3	Trane	TTP030D100A0	12 SEER	10	20
ACCU	Outside South Wall	A-2	Trane	TTP030D100A0	12 SEER	10	20
ACCU	Outside South Wall	A-1	Trane	TTP030D100A0	12 SEER	10	20
ACU (thru wall)	Southwest Wall Room B-5	B-5	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Southwest Wall Room B-6	B-6	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Southwest Wall Room B-7	B-7	Carrier	Unknown	Unknown	Unknown	15

Table 4.2.7-2 J. Harvey Rodgers Elementary School HVAC Equipment Service Lives							
ACU (thru wall)	Courtyard North Wall	Small Group	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Courtyard North Wall	Small Group	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Courtyard East Wall	SP Room	Emerson	Quiet Kool	Unknown	Unknown (Old)	15
ACU (thru wall)	Courtyard B-2 Wall	B-2	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Courtyard B-8 Wall	B-8	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Northeast Wall Room B-4	B-4	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Northeast Wall Room B-3	B-3	Carrier	Unknown	Unknown	Unknown	15

CDM also creates an inventory of observed domestic water heaters. This will attempt to inform the District 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 4.2.7-3 below.

Table 4.2-7-3 J. Harvey Rodgers School Domestic Water Heaters

Location	Make	Storage Capacity (Gallons)	Type	Heating Capacity	Estimated Age (Years)
B-Wing Boiler Room	Bradford White	119	Gas	225 MBH	7
A-Wing Boiler Room	A.O. Smith	100	Gas	150 MBH	Unknown (<17)

An inventory of observed compressors may be seen as Table 4.2.7-4 below.

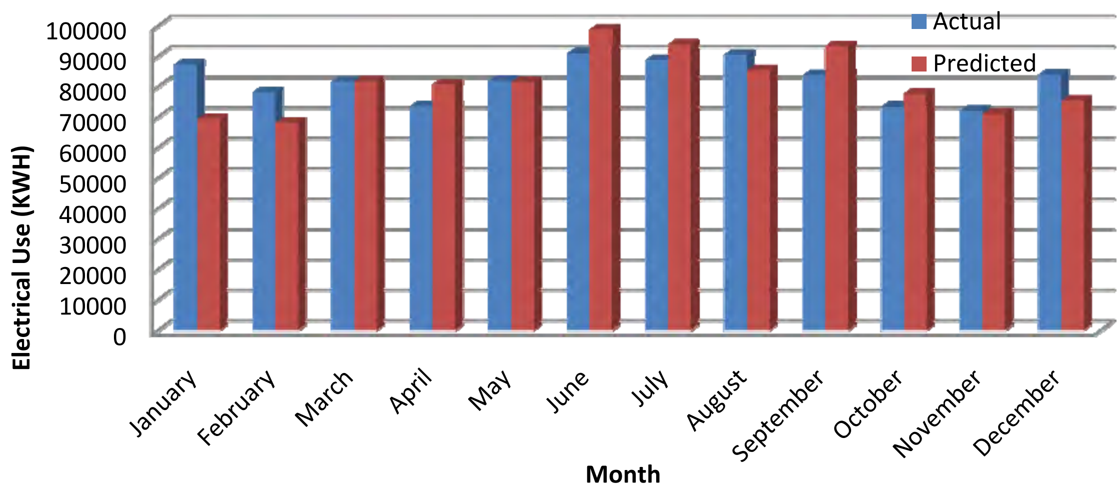
Table 4.2.7-4 J. Harvey Rodgers School Compressors

Location	Make	Receiver Capacity (Gallons)	Motor (HP)	Observed Condition
B-Wing Boiler Room	Unknown	Unknown	.5	Good

4.2.8 Thomas E. Bowe School

A model of the Thomas E. Bowe School was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity and natural gas bills from January, 2008 through November, 2009. Figure 4.2.8-1 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 two years, to yield an approximate average usage during the month of June.

Figure 4.2.8-1: Thomas E. Bowe School Electricity Usage



The annual predicted electricity usage was modeled within 1% of the actual 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 4.2.8-2 presents this information to help the District visualize where CDM anticipates the electricity is ultimately being used.

Figure 4.2.8-2: Thomas E. Bowe School Usage Breakdown

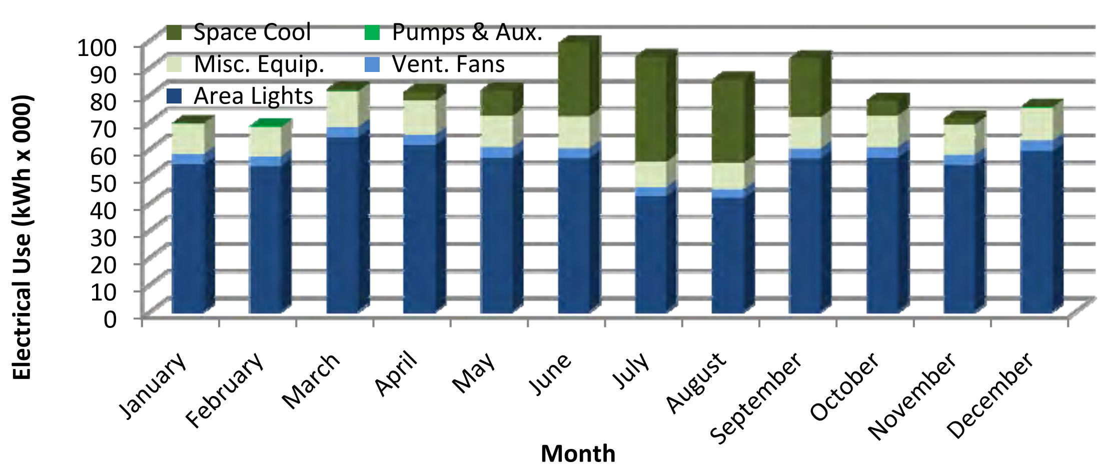
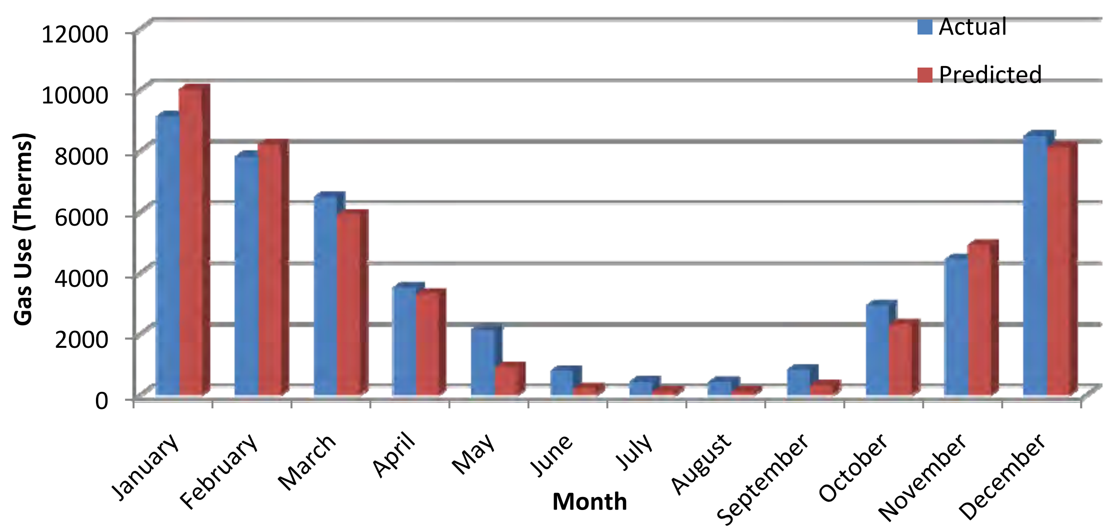


Figure 4.2.8-3 below compares actual natural gas usage to model-predicted natural gas use. The gas consumption is attributed to the gas fired rooftop units that provide heating for the school. The annual predicted gas usage was modeled within 7% of the actual usage.

Figure 4.2.8-3: Thomas E. Bowe School Natural Gas Usage



All major equipment noted during CDM's on site audit is listed in Table 4.2.8-1 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 4.2.8-1 Thomas E. Bowe School HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Gas Fired Unit Heater	Boiler Room	Boiler Room	Trane	GPA-50A	80%	Unknown	13
RTU-1	Roof	West Wing	Mammoth	DHEBFPC-322-G480 -AZ35-MZ6	80%	~9	15
RTU-2	Roof	East Wing	Mammoth	DHEBFPC-322-G480 -AZ35-MZ6	80%	~9	15
RTU-3	Roof	West Wing	Mammoth	DHEBFPC-262-G400 -AZ35-MZ6	80%	~9	15
RTU-4	Roof	East Wing	Mammoth	DHEBFPC-351-G320 -AZ35-MZ4	80%	~9	15
RTU-5	Roof	Core zones	Mammoth	DHEBFPC-322-G480 -AZ35-MZ5	80%	~9	15
RTU-6	Roof	Core zones	Mammoth	DHEBFPC-195-G256 -AZ35-MZ3	80%	~9	15
RTU-7	Roof	South Wing	Mammoth	DHEBFPC-242-G320 -AZ35-MZ5	80%	~9	15

Table 4.2.8-1 Thomas E. Bowe School HVAC Equipment Service Lives

RTU-10	Roof	North Wing (Music Room)	Mammoth	DHEBFPC-152-G256 -AZ35-MZ4	80%	~9	15
RTU-11	Roof	North Wing (Cafeteria)	Mammoth	DHEBFPC-222-G320 -AZ35-MZ2	80%	~9	15
RTU	Roof	North Wing	Modine	MDA11OCAC6 C2E1ANO275	Unknown	Unknown	15
RTU	Roof	North Wing	Captive Aire Systems	A1-D 250-G10	Unknown	4	15
RTU-S2-09	Roof	Gym	King	7040 HRB	Unknown	~9	15

CDM also takes an inventory of observed domestic water heaters. This will inform the District 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 4.2.8-2 below.

Table 4.2.8-2 Thomas E. Bowe School Domestic Water Heaters

Location	Make	Storage Capacity (Gallons)	Type	Heating Capacity	Estimated Age (Years)
Boiler Room	Paloma	Unknown	Gas	89 MBH	Unknown
Boiler Room	Patterson Kelley	Unknown	Gas	390 MBH	Unknown

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 eight systems with a total rating of approximately 2,002 kW (dc) will be appropriate for the eight School District buildings.

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 (220 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 facilities.

The following is a preliminary study on the feasibility of installing PV solar systems at the eight School District 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 facilities was performed on March 3-5th. As per the Scope of Work, only the School District facilities 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 Beach Administration Building

The roof of the Beach Administration Building is flat with 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 54.8 kW (dc).

Electrical Service

The interconnection point for the PV system will require a modification or replacement of the existing 400A, 3 Phase, 208V 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 Dorothy Bullock School

The roof of the Dorothy Bullock School is flat with 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 437.4 kW (dc).

Electrical Service

The interconnection point for the PV system will require a modification or replacement of the existing 200A, 3 Phase, 208V 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 Elsmere School

The roof of the Elsmere School is flat with 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 10 kW (dc).

Electrical Service

The interconnection point for the PV system will require a modification or replacement of the existing 400A, 1 Phase, 240V 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 Glassboro High School

The roof of the Glassboro High School is flat with 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 684.5 kW (dc).

Electrical Service

The interconnection point for the PV system will require a modification or replacement of the existing 2000A, 3 Phase, 208V 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 Glassboro Intermediate School

The roof of the Glassboro Intermediate School is flat with 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 59.2 kW (dc).

Electrical Service

The interconnection point for the PV system will require a modification or replacement of the existing 2000A, 3 Phase, 208V 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 Glassboro Intermediate School Annex

The roof of the Glassboro Intermediate School Annex is flat with numerous 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 5 kW (dc).

Electrical Service

The interconnection point for the PV system will require a modification or replacement of the existing 400A, 3 Phase, 208V 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.

4.3.1.7 J. Harvey Rodgers School

The roof of the J. Harvey Rodgers School is flat with 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 274.2 kW (dc).

Electrical Service

The interconnection point for the PV system will require a modification or replacement of the existing 1000A, 3 Phase, 208V 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.

4.3.1.8 Thomas E. Bowe School

The roof of the Thomas E. Bowe School is flat with 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 477 kW (dc).

Electrical Service

The interconnection point for the PV system will require a modification or replacement of the existing 2000A, 3 Phase, 480V 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.

4.3.1.9 Basis for Design and Calculations

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 Southern 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.

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 design to provide maximum kWh production based on available roof space.

Table 4.3-1 Summary of Solar (PV) Systems

Site	Est. Area (ft2)	kWh	Annual Energy Savings	First Year SREC Factor ($/kWH)	Est. Annual SREC	Lifetime Energy Savings (25 Years)*	Annual Return On Investment (AROI)	Net Present Value (NPV)	Internal Rate of Return (IRR)
Glassboro High School	68,449	845,735	$109,946	$0.676	$571,478	$4,072,908	4.71%	$330,863	3.49%
Glassboro Intermediate School	5,918.6	73,128	$10,238	$0.676	$49,414	$379,261	3.54%	-$68,861	1.97%
Glassboro Intermediate School Annex	500	6,178	$1,050	$0.676	$4,175	$38,908	-1.12%	-$116,017	NA
Thomas E. Bowe School	47,699	589,353	$82,509	$0.676	$398,236	$3,056,541	4.75%	$327,457	3.68%
Dorothy Bullock School	43,741.5	540,455	$81,068	$0.676	$365,195	$3,003,156	4.84%	$413,515	3.92%
J. Harvey Rodgers School	27,423.2	338,832	$50,825	$0.676	$228,955	$1,882,792	4.72%	$212,619	3.75%

Site	Est. Area (ft2)	kWh	Annual Energy Savings	First Year SREC Factor ($/kWH)	Est. Annual SREC	Lifetime Energy Savings (25 Years)*	Annual Return On Investment (AROI)	Net Present Value (NPV)	Internal Rate of Return (IRR)
Elsmere School	1,000	12,356	$1,977	$0.676	$8,349	$73,237	0.35%	-$109,859	-3.00%
Beach Administration Building	5,481.9	67,733	$10,160	$0.676	$45,768	$376,345	3.54%	-$57,508	2.10%

*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	**$23,524,010**

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 School District 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 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.

CDM has determined that it is feasible for the Glassboro School District to install wind turbine energy systems at 8 of its sites. This is primarily due to 1.9 year payback for averaged wind speeds. There are many other incentives that could possibly provide additional funding which would reduce the payback period further, and possibly eliminate the cost of the turbine installation completely.

Because the School District does not have a large area for installation of a larger wind turbine at any of the 8 locations surveyed for the audit, a small 2.5kW wind turbine was chosen. A turbine of this size could be installed in most locations. Depending on area available, and funding, the School District may choose to install more than 1 wind turbine on the premises.

Utilizing the NASA Surface Meteorology wind mapping tool, it was determined that the local average wind speeds for Glassboro, NJ ranged from 8.7 mph to 12.7 mph, or 3.89 m/s to 5.67 m/s at 20 meters above the ground. In general, around 11 mph 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 2.5kW Wind Energy Solutions (WES) Tulipo 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. 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 Wind Cad 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 industry standard of $3-$8/W to compute total cost of the wind turbine. For this analysis, CDM used $7/W. This figure includes Overhead & Profit values. By installing the proposed wind turbine, the District will offset between $585 and $1,035 per year in utility costs per facility 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 District must purchase a wind turbine on the approved NJ Clean Energy list. CDM chose the WES Tulipo wind turbine for this analysis as it is approved by the NJ Clean Energy program and is the appropriate size for smaller commercial installations and the limited area available on the site. Refer to the NJ Clean Energy website for more information.

Table 4.3-3 includes a simple payback analysis for the installation of one wind turbine energy system. Refer to Appendix K for a more detailed wind turbine financing spreadsheet, including utility cost avoidance and REC's.

Table 4.3-3: Simple Payback Analysis for Wind Turbine Energy System

Parameter	Wind Turbine (Minimum Site Wind Speed – 8.7 mph)	Wind Turbine (Maximum Site Wind Speed – 12.7 mph)	Wind Turbine (Average Site Wind Speed – 11.0 mph)
Engineer's Opinion of Probable Cost	$21,875	$21,875	$21,875
Renewable Energy Incentive Program**	-$11,104	-$21,875	-$19,648
Total Cost	$10,771	$0	$2,227
1st Year Production	3,470 kWh	7,970 kWh	6,140 kWh
Annual Estimated Electric Savings	$584.7	$1,342.9	$1034.6
Annual Estimated REC Revenue	$87	$199	$154
Project Simple Payback	**16.0 Years**	**0 Years**	**1.9 Years**
Annual Return On Investment (AROI)	2.23%	NA	49.4%
Lifetime Energy Savings (25 years)**	$21,660.1	$49,747.4	$38,326.5
Internal Rate of Return (IRR)	5.79%	NA	55.5%
Net Present Value (NPV)	$4,035.1	$34,007.1	$23,971.7

*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 4.3-3, it would benefit the School District to further investigate the installation of a wind energy system for all 8 sites. This is primarily based on the initial upfront capital investment required for a wind turbine energy system installation, the 11.0 mph average wind speed, and the 1.9 year payback period.

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 School District 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 School District 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.

4.3.3 Computer Power Management Software

Computer power management software controls the amount of time a group of desktop or laptop computers are powered up. The installation of power management software is simple, and only requires a small software package to be installed on each computer connected to a specific network. Software packages such as Night Watchman from 1e Software provide remote control of computers connected to a network, allowing for power down schedules to be setup, which can be used to optimize energy savings by turning off computers at a designated time. The power management software can also store energy/computer usage statistics in a database that can be used for energy usage analysis. CDM recommends the installation of PC power management software at six of the Glassboro School District facilities.

An energy savings analysis was performed based on the number of desktop computers provided by the school district. Laptops were omitted from the analysis based on the assumption that a laptop is powered down after use for transportation or storage, and is therefore not always connected to the School District’s network. It was also assumed that the School District does not currently have a computer shut down/standby policy, and that the implementation of the power management software would reduce the daily operating time from 24, to 9.5 hours, eight months out of the year.

Table 4.3-4 includes a simple payback analysis for the installation of PC power management software at the six Glassboro School District facilities. Refer to Appendix L for a more detailed PC power management software financing spreadsheet.

Table 4.3-4 Summary of PC Power Management Systems

Site	Engineers Opinion of Probable Cost	Annual Energy Savings	Lifetime Energy Savings (5 Years)*	Simple Payback (Years)	Annual Return On Investment (AROI)	Net Present Value (NPV)	Internal Rate of Return (IRR)
Glassboro High School	$2,410.4	$3,638.8	$19,318.9	**0.66**	146.96%	$15,253.7	152.25%
Glassboro Intermediate School	$1,232.8	$2,004.2	$10,640.6	**0.62**	158.57%	$8,496.3	164.11%
Thomas E. Bowe School	$1,913.6	$3,111.1	$16,517.3	**0.62**	158.58%	$13,188.8	164.11%
Dorothy Bullock School	$1,159.2	$2,019.2	$10,720.2	**0.57**	170.19%	$8,642.7	175.93%
J. Harvey Rodgers School	$956.8	$1,666.6	$8,848.2	**0.57**	170.18%	$7,133.5	175.92%
Beach Administration Building	$239.2	$416.7	$2,212.3	**0.57**	170.21%	$1,783.6	175.94%

*3% yearly inflation on electricity costs

**Refer to Appendix L for Computer Power Management Calculations

It should be noted that 1e also provides software to reduce the energy consumption of network devices and servers. Based on the daytime occupancy schedule and of a school building, the School District could also implement this additional power management software, and reduce the energy usage of the servers and network devices during the unoccupied afterschool and nighttime time periods. CDM recommends that the School District has further analysis performed, to access the feasibility of implementation of the additional PC power management software.

4.3.4 Ground Source Heat Pumps

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. Therefore, installation of a geothermal system is not recommended at any of the Glassboro School District facilities at this point.

4.4 Additional Measures

As discussed in Section 2, it may be possible to reduce the plug load of the buildings 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 School District can implement the use of Smart Strips within appropriate computer stations at the Glassboro High School Library 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 4.5-1 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 Classroom Application Example	
Predicted Annual Savings – 5 LCD monitors, 1 printer (kWH)	611
*Total Annual Savings	$97
Initial Capital Cost	$40
Simple Payback (months)	**5.0**
Lifetime Energy Savings (15 years)	$1,804
Net Present Value (NPV)	$1,452

*Aggregate Cost of $.1589/kWh taken from the Glassboro High School

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 School District 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 cgass, twice a year. A refrigerator's condenser cgass and cooling fins are located either under the unit behind a grille in the front or on the back of the appliance. The cgass 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.

It may also be considered that the 'Vending Misers' be purchased and utilized for vending machines throughout the schools. A 'Vending Miser' powers down a vending machine when the surrounding area is unoccupied and automatically repowers when the area is occupied, utilizing an infrared sensor. Similarly to occupancy sensors on lighting fixtures; however, the vending miser also monitors the ambient temperature while the vending machine is powered down and uses this as sort of an internal thermostat to power up the machine and ensure that the drinks remain cold. The implementation of a 'Vending Miser' also reduces maintenance costs and extends the life of the machine, by reducing the number of compressor cycles. A 'Vending Miser' is a $180 investment, but has been found to reduce power consumption of a cold drink vending machine by an average of 46%.

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 and 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. The same has been done for natural gas service.

As noted in Section 3, the District is currently benefiting from the deregulation of the market and is utilizing South Jersey Energy as their third party supplier for electric and Pepco as the third party supplier for natural gas.

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 one event a year that lasts about three 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 are 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
- Wind
- Power Management Software

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					
Location/Measure	**Engineer's Opinion of Probable Cost**	**Incentives**	**Total Cost**	**Annual Fiscal Savings[1]**	**Simple Payback (Years)**
Glassboro Intermediate School Annex - Lighting Upgrades	$1,269	$210	$1,059	$601	**1.8**
Beach Administration Building - Lighting Upgrades	$2,758	$120	$2,637.8	$672	**3.9**
Glassboro High School - Lighting Upgrades	$61,282	$6,110	$55,172	$8,178	**6.7**
Dorothy Bullock School - Lighting Upgrades	$49,071	$4,735	$44,336	$5,927	**7.5**
Thomas E. Bowe School - Lighting Upgrades	$74,097	$4,915	$69,182	$8,675	**8.0**
J. Harvey Rodgers School - Lighting Upgrades	$23,615	$1,780	$21,835	$2,538	**8.6**
Elsmere School - Lighting Upgrades	$7,032	$0	$7,032	$446	**15.8**
Glassboro Intermediate School - Lighting Upgrades	$13,175	$665	$12,510	$699	**17.9**

1. 'Total Cost' takes into account any applicable rebates.
2. 'Annual Fiscal Savings' takes into account maintenance costs savings.

6.1.2 HVAC Systems

Table 6.1-2 includes the recommended ECRM to provide energy savings for building HVAC systems, most of which provide a simple payback of less than 20 years. A detailed discussion on building HVAC systems is presented in Section 4.2.

Table 6.1-2 Ranking of Energy Savings Measures Summary – HVAC System Upgrades						
Building	**Measure**	**Retrofit Cost**	**Incentives**	**[1]Total Cost**	**[2]Annual Fiscal Savings**	**Simple Payback (Years)**
Glassboro Intermediate School	BMS	$34,886	$0	$34,886	$22,296	**1.6**
Glassboro High School	BMS	$65,501	$0	$65,501	$20,811	**3.1**
J. Harvey Rodgers School	BMS	$22,535	$0	$22,535	$5,002	**4.5**
[3] Glassboro High School	Boiler	$193,718	-	$193,718	$26,322	**7.4**
Glassboro Intermediate School	Boiler	$245,670	$12,000	$233,670	$29,644	**7.9**
Dorothy Bullock School	Boiler	$182,563	$5,000	$177,563	$20,013	**8.9**
Elsmere School	Boiler	$42,981	$698	$42,283	$2,129	**19.9**

1. 'Total Cost' takes into account any applicable rebates.
2. 'Annual Fiscal Savings' takes into account maintenance costs savings.
3. Incentives for boilers exceeding 4,000 MBH are granted on a case by basis, per New Jersey Clean Energy Program

6.1.3 Solar Energy

Implementation of new solar energy systems have been evaluated to determine the economic feasibility for furnishing and installing such systems for eight buildings for the Glassboro School District. Based on the simple payback modeling performed, it would benefit the District 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 the average 14.1 year payback period.

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 15 year period were assumed, as discussed in Section 4.3.

Table 6.1-3 includes a simple payback analysis for the installation of eight solar energy systems for the Glassboro School District. Refer to Appendix D for a more detailed solar financing spreadsheet.

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)
Dorothy Bullock School - Solar Energy System	$5,045,919	$365,195	$81,068	**11.3**
Thomas E. Bowe School - Solar Energy System	$5,491,138	$398,236	$82,509	**11.4**
Glassboro High School - Solar Energy System	$7,825,535	$571,478	$109,946	**11.5**
J. Harvey Rodgers School - Solar Energy System	$3,210,110	$228,955	$50,825	**11.5**
Beach Administration Building - Solar Energy System	$741,716	$45,768	$10,160	**13.2**
Glassboro Intermediate School - Solar Energy System	$790,843	$49,414	$10,238	**13.3**
Elsmere School - Solar Energy System	$237,500	$8,349	$1,977	**23.0**
Glassboro Intermediate School Annex - Solar Energy System	$181,250	$4,175	$1,050	**34.7**

6.1.4 Wind Power Generation

Implementation of a new on-site wind energy system has been evaluated to determine the economic feasibility for furnishing and installing such systems for the Glassboro School District. Based on the simple payback modeling performed, it would benefit the School District to further investigate installing the on-site wind energy systems at the eight surveyed locations. This is primarily based on the initial upfront capital investment required for a wind energy system installation and an acceptable payback period.

Three major factors influencing the project financial evaluation is the variance of the prevailing energy market conditions, Renewable Energy Certificate (REC) rates and the Renewable Energy Incentive Program, with the largest impact to the simple payback model being the REIP incentive.

Table 6.1-4, includes a summary of the wind energy ECRM for the Glassboro School District.

Table 6.1-4: Simple Payback Analysis for Wind Turbine Energy System

Parameter	Wind Turbine (Minimum Site Wind Speed – 8.7 mph)	Wind Turbine (Maximum Site Wind Speed – 12.7 mph)	Wind Turbine (Average Site Wind Speed – 11.0 mph)
Engineer's Opinion of Probable Cost	$21,875	$21,875	$21,875
Renewable Energy Incentive Program**	-$11,104	-$21,875	-$19,648
Total Cost	$10,771	$0	$2,227
1st Year Production	3,470 kWh	7,970 kWh	6,140 kWh
Annual Estimated Electric Savings	$584.7	$1,342.9	$1034.6
Annual Estimated REC Revenue	$87	$199	$154
Project Simple Payback	**16.0 Years**	**0 Years**	**1.9 Years**
Annual Return On Investment (AROI)	2.23%	NA	49.4%
Lifetime Energy Savings (25 years)**	$21,660.1	$49,747.4	$38,326.5
Internal Rate of Return (IRR)	5.79%	NA	55.5%
Net Present Value (NPV)	$4,035.1	$34,007.1	$23,971.7

6.1.5 Computer Power Management Software

Implementation of computer power management software has been evaluated to determine the economic feasibility for furnishing and installing such systems for the Glassboro School District. Based on the simple payback modeling performed, it would benefit the School District to further investigate installing the software at the six locations.

Table 6.1-5 includes a typical simple payback analysis for the installation of the computer power management software at six of the Glassboro School District facilities. Refer to Appendix L for a more detailed computer power management software financing spreadsheet.

Table 6.1-5: Simple Payback Analysis for Computer Power Management Software				
Site	**Engineers Opinion of Probable Cost**	**Annual Energy Savings**	**Lifetime Energy Savings (5 Years)***	**Simple Payback (Years)**
Dorothy Bullock School	$1,159.2	$2,019.2	$10,720.2	**0.57**
J. Harvey Rodgers School	$956.8	$1,666.6	$8,848.2	**0.57**
Beach Administration Building	$239.2	$416.7	$2,212.3	**0.57**
Glassboro Intermediate School	$1,232.8	$2,004.2	$10,640.6	**0.62**
Thomas E. Bowe School	$1,913.6	$3,111.1	$16,517.3	**0.62**
Glassboro High School	$2,410.4	$3,638.8	$19,318.9	**0.66**

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 CESCI program updates will be posted at www.njeda.com. For additional information, contact CESCI@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 ECSO 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)

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 G.

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.

The buildings covered under this audit that are potentially eligible for participation in the Direct Install Program, based on the requirement to have not exceeded a peak demand of 200 kW in the preceding 12 months, are the Elsmere School and the J. Harvey Rodgers School. The Direct Install Program is designed to fast-track project implementation so energy savings can be realized sooner rather than later. The steps for participation are to contact the contractor assigned and trained to provide Direct Install services in your County and schedule an Energy Assessment with this contractor. The contractor will assist in completing the Program Application and Participation Agreement.

The Energy Assessment with the participating contractor will work to determine which conservation measures qualify and the resulting project cost. Following this assessment, a scope of work will be finalized and installation will be arranged. Following completion of the installation a 'project completion form' must be submitted to the program representative assigned to the project.

The contractor for Gloucester County is:

South Jersey Energy Service Plus
Direct Install Program Hotline, Robert Senski
Phone: 866-720-2555
Email: directinstall@sjindustries.com

Any additional information on the Direct Install Program can be obtained by calling 866-NJSMART or by e-mail to DirectInstall@trcsolutions.com

APPENDIX A

UTILITY BILL INFORMATION

Electric Bills - Administration Building

Atlantic City Electric Account# 0181 9539 9995 , Meter # 65330593

Comments	Service From	Service To	Year	Atlantic City Electric Charges	kWh	South Jersey Charges	Total Charge	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/7/2007	1/8/2008	2007	$ 6.52	10	-	$ 6.52	$ 0.65	0.5	~~December~~	~~7.58+~~	~~0.5~~
	1/9/2008	2/6/2008	2008	$ 28.73	157	-	$ 28.73	$ 0.18	0.6	January	127	0.6
	2/7/2008	3/7/2008	2008	$ 12.93	53	-	$ 12.93	$ 0.24	0.5	Febuary	73	0.5
	3/8/2008	4/8/2008	2008	$ 35.66	199	-	$ 35.66	$ 0.18	0.5	March	162	0.5
	4/9/2008	5/7/2008	2008	$ 33.46	188	-	$ 33.46	$ 0.18	1.9	April	192	1.9
	5/8/2008	6/6/2008	2008	$ 15.27	66	-	$ 15.27	$ 0.23	0.5	May	98	0.5
	6/7/2008	7/8/2008	2008	$ 21.41	102	-	$ 21.41	$ 0.21	0.4	June	90	0.4
	7/9/2008	8/6/2008	2008	$ 40.69	201	-	$ 40.69	$ 0.20	0.4	July	185	0.4
	8/7/2008	9/5/2008	2008	$ 20.81	87	-	$ 20.81	$ 0.24	3.4	August	114	3.4
	9/6/2008	10/7/2008	2008	$ 27.72	127	-	$ 27.72	$ 0.22	4.8	September	114	4.8
	10/8/2008	11/5/2008	2008	$ 18.94	91	-	$ 18.94	$ 0.21	3.9	October	103	3.9
	11/6/2008	12/6/2008	2008	$ 12.98	51	-	$ 12.98	$ 0.25	3.5	November	57	3.5
	12/7/2008	1/8/2009	2008	$ 30.50	160	-	$ 30.50	$ 0.19	4.2	December	131	4.2
	1/9/2009	2/5/2009	2009	$ 53.15	324	-	$ 53.15	$ 0.16	0.5	January	305	0.5
	2/6/2009	3/9/2009	2009	$ 31.95	175	-	$ 31.95	$ 0.18	0.5	Febuary	184	0.5
	3/10/2009	4/7/2009	2009	$ 28.07	153	-	$ 28.07	$ 0.18	0.5	March	165	0.5
	4/8/2009	5/18/2009	2009	$ 16.53	201	$ 21.67	$ 38.20	$ 0.08	0.6	April	150	0.6
	5/19/2009	6/17/2009	2009	$ 8.52	70	$ 7.55	$ 16.07	$ 0.12	0.5	May	119	0.5
	6/18/2009	7/17/2009	2009	$ 6.82	36	$ 3.92	$ 10.74	$ 0.19	0.5	June	55	0.5
	7/18/2009	8/17/2009	2009	$ 12.86	140	$ 15.15	$ 28.01	$ 0.09	0.6	July	84	0.6
	8/18/2009	9/16/2009	2009	$ 8.46	60	$ 6.49	$ 14.95	$ 0.14	3.9	August	105	3.9
	9/17/2009	10/16/2009	2009	$ 10.64	96	$ 10.39	$ 21.03	$ 0.11	3.5	September	77	3.5
	10/17/2009	11/16/2009	2009	$ 10.41	90	$ 9.74	$ 20.15	$ 0.12	3.5	October	95	3.5
	11/17/2009	12/16/2009	2009	$ 18.23	206	$ 22.29	$ 40.52	$ 0.09	3.5	November	146	3.5

Electric Bills - Glassboro Administration Building

Atlantic City Electric Account # 0181 8539 9997, Meter # 83450504

Comments	Service From	Service To	Year	Atlantic City Electric Charges	kWh	South Jersey Charges	total Charge	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/7/2007	1/8/2008	2007	$ 20.14	97		$ 20.14	$ 0.21	1.0	~~December~~	~~73.48+~~	~~1.0~~
	1/9/2008	2/6/2008	2008	$ 10.92	41		$ 10.92	$ 0.27	0.7	January	56.04	0.72
	2/7/2008	3/7/2008	2008	$ 4.80	0		$ 4.80	-	0.0	Febuary	8.48	0.00
	3/8/2008	4/8/2008	2008	$ 24.09	120		$ 24.09	$ 0.20	7.3	March	90.00	7.34
	4/9/2008	5/7/2008	2008	$ 91.68	551		$ 91.68	$ 0.17	14.6	April	448.00	14.64
	5/8/2008	6/6/2008	2008	$ 117.89	693		$ 117.89	$ 0.17	15.1	May	687.40	15.08
	6/7/2008	7/8/2008	2008	$ 143.83	754		$ 143.83	$ 0.19	6.4	June	704.10	6.35
	7/9/2008	8/6/2008	2008	$ 143.89	757		$ 143.89	$ 0.19	6.0	July	788.88	6.02
	8/7/2008	9/5/2008	2008	$ 156.38	824		$ 156.38	$ 0.19	9.0	August	843.29	8.97
	9/6/2008	10/7/2008	2008	$ 227.13			$ 227.13	-		September	137.33	0.00
	10/8/2008	11/5/2008	2008	$ 120.30	736		$ 120.30	$ 0.16	24.2	October	609.10	24.18
	11/6/2008	12/6/2008	2008	$ 85.78	513		$ 85.78	$ 0.17	32.8	November	540.61	32.75
	12/7/2008	1/8/2009	2008	$ 42.31	235		$ 42.31	$ 0.18	39.1	December	277.32	39.11
	1/9/2009	2/5/2009	2009	$ 19.64	99		$ 19.64	$ 0.20	1.1	January	138.29	1.06
	2/6/2009	3/9/2009	2009	$ 20.28	99		$ 20.28	$ 0.20	1.0	Febuary	88.84	0.99
	3/10/2009	4/7/2009	2009	$ 41.10	231		$ 41.10	$ 0.18	17.9	March	203.08	17.87
	4/8/2009	5/18/2009	2009	$ 39.21	854	$ 92.09	$ 131.30	$ 0.15	2.1	April	534.83	2.10
	5/19/2009	6/17/2009	2009	$ 24.64	409	$ 44.10	$ 68.74	$ 0.17	1.3	May	552.16	1.30
	6/18/2009	7/17/2009	2009	$ 23.45	343	$ 37.36	$ 60.81	$ 0.18	1.1	June	380.40	1.10
	7/18/2009	8/17/2009	2009	$ 29.41	484	$ 52.36	$ 81.77	$ 0.17	0.3	July	412.95	0.29
	8/18/2009	9/16/2009	2009	$ 66.29	1006	$ 108.83	$ 175.12	$ 0.17	23.5	August	734.89	23.50
	9/17/2009	10/16/2009	2009	$ 47.97	1012	$ 109.48	$ 157.45	$ 0.16	0.2	September	1008.80	0.20
	10/17/2009	11/16/2009	2009	$ 35.32	690	$ 74.64	$ 109.96	$ 0.16	0.3	October	873.60	0.31
	11/17/2009	12/16/2009	2009	$ 5.26	8	$ 0.87	$ 6.13	$ 0.77	0.8	November	359.86	0.82

Electric Bills - Glassboro Administration Building

Atlantic City Electric Account # 1068 2249 9997, Meter # 39887386

Comments	Service From	Service To	Year	Atlantic City Electric Charges	kWh	South Jersey Charges	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/6/2007	1/7/2008	2008	$ 5.43	1.00		$ 5.43	0.0	~~December~~	~~.79+~~	~~0.00~~
	1/8/2008	2/5/2008	2008	$ 4.64	0.00		-	0.0	January	0.21	0.00
	2/6/2008	3/6/2008	2008	$ 4.80	0.00		-	0.0	Febuary	0.00	0.00
	3/7/2008	4/7/2008	2008	$ 5.12	0.00		-	0.0	March	0.00	0.00
	4/8/2008	5/6/2008	2008	$ 6.18	10.00		$ 0.62	0.0	April	7.93	0.00
	5/7/2008	6/5/2008	2008	$ 4.80	0.00		-	0.0	May	2.07	0.00
	6/6/2008	7/7/2008	2008	$ 15.88	60.00		$ 0.26	0.4	June	46.88	0.40
	7/8/2008	8/5/2008	2008	$ 4.64	0.00		-	0.0	July	13.13	0.00
	8/6/2008	9/4/2008	2008	$ 4.80	0.00		-	0.0	August	0.00	0.00
	9/5/2008	10/6/2008	2008	$ 7.55	14.00		$ 0.54	0.0	September	11.38	0.00
	10/7/2008	11/4/2008	2008	$ 4.64	0.00		-	0.0	October	2.63	0.00
	11/5/2008	12/5/2008	2008	$ 4.96	0.00		-	0.0	November	0.00	0.00
	12/6/2008	1/7/2009	2008	$ 5.28	0.00		-	0.0	December	0.00	0.00
	1/8/2009	2/4/2009	2009	$ 4.48	0.00		-	0.0	January	0.00	0.00
	2/5/2009	3/6/2009	2009	$ 4.95	1.00		$ 4.95	0.0	Febuary	0.80	0.00
	3/7/2009	4/6/2009	2009	$ 4.96	0.00		-	0.0	March	0.20	0.00
	4/7/2009	5/19/2009	2009	$ 6.88	0.00	$ -	-	0.0	April	0.00	0.00
	5/20/2009	6/18/2009	2009	$ 6.21	26.00	$ 2.80	$ 0.24	0.0	May	9.86	0.00
	6/19/2009	7/20/2009	2009	$ 9.29	74.00	$ 8.06	$ 0.13	0.0	June	43.89	0.00
	7/21/2009	8/18/2009	2009	$ 5.22	10.00	$ 1.08	$ 0.52	0.0	July	50.04	0.00
	8/19/2009	9/17/2009	2009	$ 4.80	7.00	$ 0.76	-	0.0	August	6.21	0.00
	9/18/2009	10/19/2009	2009	$ 46.29	7.00	$ 0.76	$ 6.61	0.0	September	387.56	0.00
	10/20/2009	11/17/2009	2009	$ 5.01	7.00	$ 0.76	$ 0.72	0.0	October	569.30	0.00
	11/18/2009	12/17/2009	2009	$ 10.45	101.00	$ 10.93	$ 0.10	0.0	November	47.87	0.00

Electric Bills - Glassboro Administration Building

Atlantic City Electric Account # 0090 0479 9996, Meter # 105750809

Comments	Service From	Service To	Year	Atlantic City Electric Charges	kWh	South Jersey Charges	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/5/2007	1/4/2008	2007	$ 5.41	3.00		$ 1.80	0.0	~~December~~	~~2.61+~~	~~0.0~~
	1/5/2008	2/4/2008	2008	$ 6.02	7.00		$ 0.86	0.0	January	6.49	0.00
	2/5/2008	3/5/2008	2008	$ 5.25	3.00		$ 1.75	0.1	Febuary	3.38	0.06
	3/6/2008	4/4/2008	2008	$ 6.64	12.00		$ 0.55	0.1	March	10.92	0.06
	4/5/2008	5/5/2008	2008	$ 6.80	12.00		$ 0.57	0.2	April	11.66	0.20
	5/6/2008	6/4/2008	2008	$ 7.80	19.00		$ 0.41	0.1	May	10.41	0.10
	6/5/2008	7/3/2008	2008	$ 15.76	62.00		$ 0.25	0.1	June	58.12	0.10
	7/4/2008	8/4/2008	2008	$ 5.66	3.00		$ 1.89	0.0	July	9.03	0.01
	8/5/2008	9/3/2008	2008	$ 5.34	3.00		$ 1.78	0.3	August	3.08	0.26
	9/4/2008	10/3/2008	2008	$ 6.19	8.00		$ 0.77	0.5	September	7.50	0.50
	10/4/2008	11/3/2008	2008	$ 5.42	3.00		$ 1.81	0.4	October	3.51	0.40
	11/4/2008	12/4/2008	2008	$ 6.64	11.00		$ 0.60	0.4	November	9.87	0.36
	12/5/2008	1/6/2009	2008	$ 6.50	8.00		$ 0.81	0.4	December	7.97	0.40
	1/7/2009	2/3/2009	2009	$ 9.83	35.00		$ 0.28	0.3	January	47.25	0.30
	2/4/2009	3/5/2009	2009	$ 5.11	2.00		$ 2.56	0.0	Febuary	5.42	0.00
	3/6/2009	4/3/2009	2009	$ 26.24	141.00		$ 0.19	0.8	March	126.74	0.80
	4/4/2009	5/20/2009	2009	$ 9.20	31.00	$ 3.34	$ 0.40	6.7	April	32.40	6.70
	5/21/2009	6/19/2009	2009	$ 6.99	40.00	$ 4.31	$ 0.28	0.8	May	27.86	0.83
	6/20/2009	7/21/2009	2009	$ 6.07	17.00	$ 1.85	$ 0.47	0.0	June	31.17	0.01
	7/22/2009	8/19/2009	2009	$ 4.75	2.00	$ 0.22	$ 2.49	0.0	July	11.85	0.03
	8/20/2009	9/18/2009	2009	$ 4.98	3.00	$ 1.25	$ 2.08	0.3	August	2.51	0.26
	9/19/2009	10/20/2009	2009	$ 5.64	9.00	$ 1.26	$ 0.77	0.5	September	5.17	0.50
	10/21/2009	11/18/2009	2009	$ 5.59	17.00	$ 1.84	$ 0.44	0.6	October	12.08	0.60
	11/19/2009	12/18/2009	2009	$ 4.80	0.00	$ 1.28		0.0	November	10.55	0.00

Electric Bills - Glassboro Administration Building

Atlantic City Electric Account # 0181 9579 9996, Meter # 95162541

Comments	Service From	Service To	Year	Atlantic City Electric Charges	kWh	South Jersey Charge	Total Charge	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/7/2007	1/8/2008	2007	$ 1,979.18	13908		$1,979.18	$ 0.14	25.15	~~December~~	~~13908+~~	~~25.15~~
	1/9/2008	2/6/2008	2008	$ 1,708.18	11944		$1,708.18	$ 0.14	25.97	January	12949.83	25.97
	2/7/2008	3/7/2008	2008	$ 1,578.23	11027		$1,578.23	$ 0.14	23.47	Febuary	10925.2	23.47
	3/8/2008	4/8/2008	2008	$ 1,761.86	12133		$1,761.86	$ 0.15	24.29	March	11672.72	24.29
	4/9/2008	5/7/2008	2008	$ 1,645.14	11270		$1,645.14	$ 0.15	25.15	April	11582.91	25.15
	5/8/2008	6/6/2008	2008	$ 1,900.85	12332		$1,900.85	$ 0.15	30.06	May	12585.84	30.06
	6/7/2008	7/8/2008	2008	$ 2,756.42	15057		$2,756.42	$ 0.18	41.51	June	19759.15	41.51
	7/9/2008	8/6/2008	2008	$ 2,586.72	14500		$2,586.72	$ 0.18	35.35	July	15264.25	35.35
	8/7/2008	9/5/2008	2008	$ 2,287.85	12476		$2,287.85	$ 0.18	37.25	August	13396.67	37.25
	9/6/2008	10/7/2008	2008	$ 2,267.21	13020		$2,267.21	$ 0.17	33.26	September	12251.21	33.26
	10/8/2008	11/5/2008	2008	$ 1,627.64	10963		$1,627.64	$ 0.15	30.00	October	11920.96	30.00
	11/6/2008	12/6/2008	2008	$ 1,441.04	9739		$1,441.04	$ 0.15	23.87	November	9742.59	23.87
	12/7/2008	1/8/2009	2008	$ 1,571.40	11015		$1,571.40	$ 0.14	22.91	December	10229.67	22.91
	1/9/2009	2/5/2009	2009	$ 1,411.56	9944		$1,411.56	$ 0.14	24.49	January	10838.59	24.49
	2/6/2009	3/9/2009	2009	$ 1,492.43	10275		$1,492.43	$ 0.15	26.52	Febuary	9160.87	26.52
	3/10/2009	4/7/2009	2009	$ 1,565.44	11233		$1,565.44	$ 0.14	26.10	March	11411.43	26.10
	4/8/2009	5/18/2009	2009	$ 541.63	13853	$ 1,493.77	$2,035.40	$ 0.15	41.24	April	10482.61	41.24
	5/19/2009	6/17/2009	2009	$ 440.11	13128	$ 1,415.59	$1,855.70	$ 0.14	35.12	May	11770.60	35.12
	6/18/2009	7/17/2009	2009	$ 469.03	13086	$ 1,386.46	$1,855.49	$ 0.14	32.76	June	13109.80	32.76
	7/18/2009	8/17/2009	2009	$ 517.74	13380	$ 1,447.45	$1,965.19	$ 0.15	39.51	July	13457.98	39.51
	8/18/2009	9/16/2009	2009	$ 512.71	13718	$ 1,484.01	$1,996.72	$ 0.15	39.51	August	13739.15	39.51
	9/17/2009	10/16/2009	2009	$ 420.56	10616	$ 1,148.44	$1,569.00	$ 0.15	31.34	September	12270.40	31.34
	10/17/2009	11/16/2009	2009	$ 404.86	9170	$ 992.01	$1,396.87	$ 0.15	31.34	October	10098.97	31.34
	11/17/2009	12/16/2009	2009	$ 414.06	10398	$ 1,124.86	$1,538.92	$ 0.15	31.34	November	9585.30	31.34

Month	Use (KWH)	Demand (KW)
January	12234	27
February	10225	26
March	11921	39
April	11721	46
May	12931	42
June	17139	42
July	15138	41
August	14472	59
September	13571	37
October	12276	35
November	10250	48
December	11990	35
Total	**153870**	**476.7**

Electric Bills - Glassboro Dorothy Bullock School

Atlantic City Electric Account# 1148 5439 9994 , Meter # 83995987

Comments	Service From	Service To	Year	Atlantic City Electric Charges	South Jersey Supply Charge	Total Charge	kWh	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/8/2007	1/9/2008	2007	$ 10,180.34		$ 10,180.34	70200	$ 0.15	315.0	~~December~~	~~50456.25+~~	~~315.00~~
	1/10/2008	2/7/2008	2008	$ 11,575.43		$ 11,575.43	69000	$ 0.17	600.0	January	72089	600.0
	2/8/2008	3/10/2008	2008	$ 9,447.76		$ 9,447.76	64200	$ 0.15	315.0	Febuary	60145	315.0
	3/11/2008	4/9/2008	2008	$ 11,416.42		$ 11,416.42	65700	$ 0.17	600.0	March	66700	600.0
	4/10/2008	5/8/2008	2008	$ 10,856.59		$ 10,856.59	61800	$ 0.18	600.0	April	64462	600.0
	5/9/2008	6/9/2008	2008	$ 14,373.48		$ 14,373.48	84900	$ 0.17	600.0	May	168070	600.0
	6/10/2008	7/9/2008	2008	$ 20,153.58		$ 20,153.58	126000	$ 0.16	315.0	June	112078	315.0
	7/10/2008	8/7/2008	2008	$ 18,857.16		$ 18,857.16	111300	$ 0.17	600.0	July	122234	600.0
	8/8/2008	9/8/2008	2008	$ 18,146.91		$ 18,146.91	102900	$ 0.18	600.0	August	104041	600.0
	9/9/2008	10/8/2008	2008	$ 18,596.26		$ 18,596.26	113700	$ 0.16	600.0	September	109105	600.0
	10/9/2008	11/6/2008	2008	$ 10,549.78		$ 10,549.78	66600	$ 0.16	480.0	October	83141	480.0
	11/7/2008	12/8/2008	2008	$ 10,408.48		$ 10,408.48	62100	$ 0.17	282.0	November	37854	282.0
	12/9/2008	1/9/2009	2008	$ 11,175.19		$ 11,175.19	68400	$ 0.16	282.0	December	57188	282.0
	1/10/2009	2/6/2009	2009	$ 10,315.82		$ 10,315.82	63300	$ 0.16	282.0	January	68973	282.0
	2/7/2009	3/10/2009	2009	$ 11,086.43		$ 11,086.43	66000	$ 0.17	150.0	Febuary	58939	150.0
	3/11/2009	4/8/2009	2009	$ 10,034.63		$ 10,034.63	59700	$ 0.17	282.0	March	63856	282.0
	4/9/2009	5/19/2009	2009	$ 4,412.25	$ 10,041.80	$ 14,454.05	95700	$ 0.15	282.0	April	67820	282.0
	5/20/2009	6/18/2009	2009	$ 3,950.30	$ 10,986.17	$ 14,936.47	104700	$ 0.14	270.0	May	86229	270.0
	6/19/2009	7/20/2009	2009	$ 4,339.87	$ 10,520.84	$ 14,860.71	99300	$ 0.15	270.0	June	100058	270.0
	7/21/2009	8/18/2009	2009	$ 4,244.30	$ 11,620.70	$ 15,865.00	110400	$ 0.14	294.0	July	103938	294.0
	8/19/2009	9/17/2009	2009	$ 4,178.33	$ 10,547.05	$ 14,725.38	100200	$ 0.15	294.0	August	111944	294.0
	9/18/2009	10/16/2009	2009	$ 4,824.78		$ 4,824.78	109800	$ 0.04	600.0	September	106001	600.0
	10/17/2009	11/17/2009	2009	$ 2,203.91	$ 3,094.64	$ 5,298.55	29400	$ 0.18	294.0	October	74361	294.0
	11/18/2009	12/17/2009	2009	$ 2,208.78	$ 6,189.29	$ 8,398.07	58800	$ 0.14	120.0	November	41099	120.0

Month	Use (KWH)	Demand (KW)
January	70531	441.0
February	59542	232.5
March	65278	441.0
April	66141	441.0
May	127150	435.0
June	106068	292.5
July	113086	447.0
August	107992	447.0
September	107553	600.0
October	78751	387.0
November	39477	201.0
December	57188	282.0
Total	998756	

Electric Bills - Glassboro Elsmere School												
Atlantic City Electric Account# 0224 0649 9990 , Meter # 94910909												
Comments	Service From	Service To	Year	Atlantic City Electric Charges	South Jersey Supply Charges	Total Charge	kWh	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/6/2007	1/7/2008	2007	$ 313.05		$ 313.05	1965.00	$ 0.16	9.87	~~December~~	~~1548.18~~	~~9.87~~
	1/8/2008	2/5/2008	2008	$ 306.22		$ 306.22	1978.00	$ 0.15	9.48	January	2053.79	9.48
	2/6/2008	3/6/2008	2008	$ 306.24		$ 306.24	1983.00	$ 0.15	9.07	Febuary	1913.75	9.07
	3/7/2008	4/7/2008	2008	$ 287.51		$ 287.51	1841.00	$ 0.16	7.67	March	1848.56	7.67
	4/8/2008	5/6/2008	2008	$ 288.52		$ 288.52	1782.00	$ 0.16	9.37	April	1816.03	9.37
	5/7/2008	6/5/2008	2008	$ 243.61		$ 243.61	1570.00	$ 0.16	5.49	May	1677.02	5.49
	6/6/2008	7/7/2008	2008	$ 180.45		$ 180.45	953.00	$ 0.19	10.48	June	1006.20	10.48
	7/8/2008	8/5/2008	2008	$ 173.71		$ 173.71	919.00	$ 0.19	10.48	July	969.02	10.48
	8/6/2008	9/4/2008	2008	$ 154.00		$ 154.00	811.00	$ 0.19	11.50	August	861.32	11.50
	9/5/2008	10/6/2008	2008	$ 209.05		$ 209.05		#DIV/0!		September	108.13	0.00
	10/7/2008	11/4/2008	2008	$ 266.77		$ 266.77	1643.00	$ 0.16	9.09	October	1416.38	9.09
	11/5/2008	12/5/2008	2008	$ 274.37		$ 274.37	1701.00	$ 0.16	8.54	November	1653.27	8.54
	12/6/2008	1/7/2009	2009	$ 343.10		$ 343.10	2186.00	$ 0.16	8.69	December	1996.65	8.69
	1/8/2009	2/4/2009	2009	$ 290.25		$ 290.25	1937.00	$ 0.15	6.77	January	2123.98	6.77
	2/5/2009	3/6/2009	2009	$ 295.73		$ 295.73	1938.00	$ 0.15	7.19	Febuary	1827.11	7.19
	3/7/2009	4/6/2009	2009	$ 285.30		$ 285.30	1776.00	$ 0.16	8.49	March	1819.86	8.49
	4/7/2009	5/19/2009	2009	$ 129.10	$ 300.31	$ 429.41	2785.00	$ 0.15	9.54	April	1898.16	9.54
	5/20/2009	6/18/2009	2009	$ 121.85	$ 245.74	$ 367.59	2279.00	$ 0.16	10.84	May	2142.18	10.84
	6/19/2009	7/20/2009	2009	$ 171.54	$ 320.01	$ 491.55	2938.00	$ 0.17	12.87	June	2469.15	12.87
	7/21/2009	8/18/2009	2009	$ 161.64	$ 292.84	$ 454.48	2707.00	$ 0.17	13.92	July	2863.04	13.92
	8/19/2009	9/17/2009	2009	$ 150.44	$ 262.01	$ 412.45	2422.00	$ 0.17	13.25	August	2729.74	13.25
	9/18/2009	10/19/2009	2009	$ 187.11	$ 394.64	$ 581.75	3648.00	$ 0.16	13.20	September	2854.47	13.20
	10/20/2009	11/17/2009	2009	$ 160.11	$ 321.29	$ 481.40	2970.00	$ 0.16	15.92	October	3394.97	15.92
	11/18/2009	12/17/2009	2009	$ 155.58	$ 360.67	$ 516.25	3334.00	$ 0.15	10.85	November	3185.77	10.85

Month	Use (KWH)	Demand (KW)
January	2088.89	8.13
February	1870.43	8.13
March	1834.21	8.08
April	1857.10	9.46
May	1909.60	8.17
June	1737.68	11.68
July	1916.03	12.20
August	1795.53	12.38
September	2854.47	13.20
October	3394.97	15.92
November	2419.52	9.70
December	1996.65	8.69
Total	**25675**	

Electric Bills - Glassboro High School

Atlantic City Electric Account# 1148 5439 9937 , Meter #91707232

Comments	Service From	Service To	Year	Atlantic City Electric Charges	South Jersey Supply Charges	Total Charge	kWh	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/7/2007	1/8/2008	2007	$ 75.62		$ 75.62	470	$ 0.16	1.0	~~December~~	~~356.06 +~~	~~0.97~~
	1/9/2008	2/6/2008	2008	$ 58.32		$ 58.32	351	$ 0.17	1.0	January	392	0.95
	2/7/2008	3/7/2008	2008	$ 48.51		$ 48.51	277	$ 0.18	0.8	Febuary	283	0.8
	3/8/2008	4/8/2008	2008	$ 57.05		$ 57.05	332	$ 0.17	0.8	March	313	0.8
	4/9/2008	5/7/2008	2008	$ 96.48		$ 96.48	574	$ 0.17	11.7	April	521	11.7
	5/8/2008	6/6/2008	2008	$ 80.08		$ 80.08	454	$ 0.18	11.1	May	502	11.1
	6/7/2008	7/8/2008	2008	$ 228.10		$ 228.10	1205	$ 0.19	11.8	June	995	11.8
	7/9/2008	8/6/2008	2008	$ 267.24		$ 267.24	1421	$ 0.19	11.5	July	1428	11.5
	8/7/2008	9/5/2008	2008	$ 242.59		$ 242.59	1286	$ 0.19	94.1	August	1366	94.1
	9/6/2008	10/7/2008	2008	$ 305.40		$ 305.40	2454	$ 0.12	96.3	September	2132	96.3
	10/8/2008	11/5/2008	2008	$ 308.32		$ 308.32	1925	$ 0.16	96.3	October	2130	96.3
	11/6/2008	12/6/2008	2008	$ 219.97		$ 219.97	1357	$ 0.16	86.4	November	1426	86.4
	12/7/2009	1/8/2009	2008	$ 108.25		$ 108.25	645	$ 0.17	86.3	December	751	86.3
	1/9/2009	2/5/2009	2009	$ 56.11		$ 56.11	338	$ 0.17	0.8	January	434	0.8
	2/6/2009	3/9/2009	2009	$ 53.90		$ 53.90	310	$ 0.17	0.8	Febuary	283	0.8
	3/10/2009	4/7/2009	2009	$ 53.12		$ 53.12	312	$ 0.17	0.8	March	324	0.8
	4/8/2009	5/18/2009	2009	$ 21.53	$ 29.01	$ 50.54	269	$ 0.19	0.8	April	226	0.8
	5/19/2009	6/17/2009	2009	$ 36.33	$ 56.29	$ 92.62	522	$ 0.18	11.4	May	344	11.4
	6/18/2009	7/17/2009	2009	$ 59.84	$ 95.96	$ 155.80	881	$ 0.18	11.5	June	678	11.5
	7/18/2009	8/17/2009	2009	$ 48.38	$ 74.64	$ 123.02	690	$ 0.18	11.7	July	821	11.7
	8/18/2009	9/16/2009	2009	$ 111.68	$ 187.04	$ 298.72	1729	$ 0.17	42.1	August	1185	42.1
	9/17/2009	10/16/2009	2009	$ 895.39	$ 1,897.48	$ 2,792.87	17540	$ 0.16	64.6	September	9107	64.6
	10/17/2009	11/13/2009	2009	$ 107.56	$ 201.00	$ 308.56	1684	$ 0.18	96.3	October	10257	96.3
	11/14/2009	12/16/2009	2009	$ 126.72	$ 214.63	$ 341.35	1984	$ 0.17	92.6	November	1804	92.6

Electric Bills - Glassboro High School

Atlantic City Electric Account# 0181 9549 9993, Meter #83996178

Comments	Service From	Service To	Year	Atlantic City Electric Charges	South Jersey Charge	Total Charge	kWh	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/7/2007	1/8/2008	2007	$ 15,742.03		$ 15,742.03	121200	$ 0.13	291.0	~~December~~	~~81818.18 +~~	~~291.0~~
	1/9/2008	2/6/2008	2008	$ 14,607.36		$ 14,607.36	113400	$ 0.13	300.0	January	119320	300.0
	2/7/2008	3/7/2008	2008	$ 16,479.88		$ 16,479.88	129600	$ 0.13	300.0	Febuary	121779	300.0
	3/8/2008	4/8/2008	2008	$ 12,485.18		$ 12,485.18	92100	$ 0.14	267.0	March	99615	267.0
	4/9/2008	5/7/2008	2008	$ 11,924.26		$ 11,924.26	88800	$ 0.13	228.0	April	91133	228.0
	5/8/2008	6/6/2008	2008	$ 13,867.50		$ 13,867.50	111600	$ 0.12	330.0	May	110714	330.0
	6/7/2008	7/8/2008	2008	$ 25,740.27		$ 25,740.27	171000	$ 0.15	384.0	June	150570	384.0
	7/9/2008	8/6/2008	2008	$ 22,334.93		$ 22,334.93	151200	$ 0.15	285.0	July	162667	285.0
	8/7/2008	9/5/2008	2008	$ 21,208.10		$ 21,208.10	140400	$ 0.15	345.0	August	148283	345.0
	9/6/2008	10/7/2008	2008	$ 24,444.47		$ 24,444.47	169800	$ 0.14	348.0	September	156056	348.0
	10/8/2008	11/5/2008	2008	$ 14,753.19		$ 14,753.19	114300	$ 0.13	312.0	October	131737	312.0
	11/6/2008	12/6/2008	2008	$ 13,651.22		$ 13,651.22	103200	$ 0.13	270.0	November	102933	270.0
	12/7/2008	1/8/2009	2008	$ 16,693.76		$ 16,693.76	129000	$ 0.13	282.0	December	117701	282.0
	1/9/2009	2/5/2009	2009	$ 14,945.56		$ 14,945.56	115500	$ 0.13	279.0	January	126248	279.0
	2/6/2009	3/9/2009	2009	$ 15,253.77		$ 15,253.77	115500	$ 0.13	270.0	Febuary	103641	270.0
	3/10/2009	4/7/2009	2009	$ 15,522.66		$ 15,522.66	111000	$ 0.14	276.0	March	116691	276.0
	4/8/2009	5/18/2009	2009	$ 4,011.28	$ 15,267.32	$ 19,278.60	145500	$ 0.13	363.0	April	108415	363.0
	5/19/2009	6/17/2009	2009	$ 3,903.99	$ 16,463.52	$ 20,367.51	156900	$ 0.13	351.0	May	131868	351.0
	6/18/2009	7/17/2009	2009	$ 4,029.90	$ 15,288.58	$ 19,318.48	144300	$ 0.13	321.0	June	151440	321.0
	7/18/2009	8/17/2009	2009	$ 3,952.64	$ 15,062.71	$ 19,015.35	143100	$ 0.13	297.0	July	146396	297.0
	8/18/2009	9/16/2009	2009	$ 4,244.40	$ 16,388.98	$ 20,633.38	155700	$ 0.13	327.0	August	151134	327.0
	9/17/2009	10/16/2009	2009	$ 3,699.79	$ 13,389.07	$ 17,088.86	127200	$ 0.13	312.0	September	142400	312.0
	10/17/2009	11/16/2009	2009	$ 3,218.58	$ 9,189.20	$ 12,407.78	87300	$ 0.14	327.0	October	110082	327.0
	11/17/2009	12/16/2009	2009	$ 3,141.64	$ 11,115.46	$ 14,257.10	105600	$ 0.14	249.0	November	94338	249.0

Month	Use (KWH)	Demand (KW)
January	123197	290
February	112993	286
March	108472	272
April	100148	302
May	121714	352
June	151841	364
July	155656	303
August	150984	404
September	154848	410
October	127103	416
November	100250	349
December	118453	368
Total	**1525658**	**4116.3**

Electric Bills - Glassboro Intermediate School

Atlantic City Electric Account# 3234 5689 9984, Meter #80592174

Comments	Service From	Service To	Year	Atlantic City Electric Charges	South Jersey Supply Charges	Total Charges	kWh	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/6/2007	1/7/2008	2007	$ 9,353.15		$ 9,353.15	61200	$ 0.15	339.0	~~December~~	~~48218.18~~	~~339.00~~
	1/8/2008	2/5/2008	2008	$ 9,383.91		$ 9,383.91	64200	$ 0.15	339.0	January	66112.85	339.00
	2/6/2008	3/6/2008	2008	$ 11,984.96		$ 11,984.96	91500	$ 0.13	261.0	Febuary	83637.94	261.00
	3/7/2008	4/7/2008	2008	$ 4,849.19		$ 4,849.19	21000	$ 0.23	339.0	March	35189.09	339.00
	4/8/2008	5/6/2008	2008	$ 7,863.05		$ 7,863.05	57000	$ 0.14	39.0	April	49948.84	339.00
	5/7/2008	6/5/2008	2008	$ 15,224.69		$ 15,224.69	119100	$ 0.13	399.0	May	111043.10	399.00
	6/6/2008	7/7/2008	2008	$ 19,084.94		$ 19,084.94	123900	$ 0.15	339.0	June	116646.88	339.00
	7/8/2008	8/5/2008	2008	$ 19,441.01		$ 19,441.01	129300	$ 0.15	21.0	July	134110.00	339.00
	8/6/2008	9/4/2008	2008	$ 19,996.62		$ 19,996.62	132900	$ 0.15	261.0	August	115180.00	261.00
	9/5/2008	10/6/2008	2008	$ 20,587.99		$ 20,587.99	139800	$ 0.15	339.0	September	131307.50	339.00
	10/7/2008	11/4/2008	2008	$ 12,475.86		$ 12,475.86	92400	$ 0.14	339.0	October	105867.67	339.00
	11/5/2008	12/5/2008	2008	$ 8,888.71		$ 8,888.71	58200	$ 0.15	339.0	November	61557.73	339.00
	12/6/2008	1/7/2009	2009	$ 9,383.93		$ 9,383.93	60900	$ 0.15	339.0	December	57368.82	339.00
	1/8/2009	2/4/2009	2009	$ 8,932.23		$ 8,932.23	41400.00	$ 0.22	636.00	January	48403.90	636.00
	2/5/2009	3/6/2009	2009	$ 3,811.91		$ 3,811.91	12900.00	$ 0.30	147.00	Febuary	16234.29	147.00
	3/4/2009	4/6/2009	2009	$ 10,575.33		$ 10,575.33	73200.00	$ 0.14	171.00	March	61612.26	171.00
	4/7/2009	5/18/2009	2009	$ 3,414.79	$ 10,765.82	$ 14,180.61	102600.00	$ 0.14	237.00	April	72796.31	237.00
	5/19/2009	6/18/2009	2009	$ 3,691.61	$ 12,465.68	$ 16,157.29	118800.00	$ 0.14	399.00	May	93790.78	399.00
need atlantic city bill	6/19/2009	7/19/2009	2009		$ 11,537.96	$ 11,537.96	108900.00	$ 0.11		June	111136.00	399.00
	7/20/2009	8/18/2009	2009	$ 3,850.81	$ 10,389.16	$ 14,239.97	98700.00	$ 0.14	21.00	July	106225.00	21.00
	8/19/2009	9/17/2009	2009	$ 2,761.45	$ 10,768.10	$ 13,529.55	102300.00	$ 0.13	192.00	August	127850.00	192.00
	9/18/2009	10/19/2009	2009	$ 3,489.63	$ 12,252.26	$ 15,741.89	116400.00	$ 0.14	291.00	September	105257.00	291.00
	10/20/2009	11/17/2009	2009	$ 2,473.76	$ 6,347.18	$ 8,820.94	60300.00	$ 0.15	291.00	October	94064.22	291.00
	11/18/2009	12/17/2009	2009	$ 2,519.91	$ 6,284.02	$ 8,803.93	59700.00	$ 0.15	291.00	November	61218.28	291.00

Month	Use (KWH)	Demand (KW)
January	57258	487.5
February	49936	204.0
March	48401	255.0
April	61373	288.0
May	102417	399.0
June	113891	369.0
July	120168	339.0
August	127850	192.0
September	118282	315.0
October	99966	315.0
November	61388	315.0
December	57369	339.0
Total	**1018299**	

Electric Bills - Glassboro Intermediate School Annex														
Atlantic City Electric Account# 0182 3179 9992 , Meter # 80799460														
Comments	Service From	Service To	Year	Atlantic City Electric Charges	kWh	SJ Energy Charge	Total Charge	Cost Per KWH	Measured Demand (kW)	Total Charge	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/6/2007	1/7/2008	2007	$ 150.99	1025.00		$150.99	$ 0.15	3.6	$ 150.99	December	807.58 +	3.6
	1/8/2008	2/5/2008	2008	$ 132.79	901.00		$132.79	$ 0.15	3.6	$ 132.79	January	963	3.6
	2/6/2008	3/6/2008	2008	$ 118.94	792.00		$118.94	$ 0.15	3.6	$ 118.94	Febuary	783	3.6
	3/7/2008	4/7/2008	2008	$ 99.13	645.00		$99.13	$ 0.15	3.3	$ 99.13	March	668	3.3
	4/8/2008	5/6/2008	2008	$ 74.27	481.00		$74.27	$ 0.15	2.5	$ 74.27	April	523	2.5
	5/7/2008	6/5/2008	2008	$ 35.22	193.00		$35.22	$ 0.18	2.0	$ 35.22	May	260	2.0
	6/6/2008	7/7/2008	2008	$ 101.52	524.00		$101.52	$ 0.19	5.6	$ 101.52	June	442	5.6
	7/8/2008	8/5/2008	2008	$ 316.49	1767.00		$316.49	$ 0.18	5.7	$ 316.49	July	1577	5.7
	8/6/2008	9/4/2008	2008	$ 203.06	1068.00		$203.06	$ 0.19	5.4	$ 203.06	August	1230	5.4
	9/5/2008	10/6/2008	2008	$ 120.12	643.00		$120.12	$ 0.19	5.3	$ 120.12	September	665	5.3
	10/7/2008	11/4/2008	2008	$ 35.60	203.00		$35.60	$ 0.18	2.1	$ 35.60	October	296	2.1
	11/5/2008	12/5/2008	2008	$ 43.96	255.00		$43.96	$ 0.17	2.2	$ 43.96	November	242	2.2
	12/6/2008	1/7/2009	2008	$ 45.54	263.00		$45.54	$ 0.17	2.1	$ 45.54	December	248	2.1
	1/8/2009	2/4/2009	2008	$ 136.07	834.00		$136.07	$ 0.16	6.9	$ 136.07	January	771	6.9
	2/5/2009	3/6/2009	2009	$ 119.83	729.00		$119.83	$ 0.16	6.9	$ 119.83	Febuary	702	6.9
	3/7/2009	4/6/2009	2009	$ 113.19	686.00		$113.19	$ 0.17	6.9	$ 113.19	March	699	6.9
	4/7/2009	5/19/2009	2009	$ 43.35	674.00	$ 72.68	$116.03	$ 0.17	6.9	$ 116.03	April	509	6.9
	5/20/2009	6/18/2009	2009	$ 38.68	581.00	$ 62.65	$101.33	$ 0.17	7.9	$ 101.33	May	360	7.9
	6/19/2009	7/20/2009	2009	$ 40.81	584.00	$ 63.61	$104.42	$ 0.18	6.9	$ 104.42	June	568	6.9
	7/21/2009	8/18/2009	2009	$ 61.89	878.00	$ 94.98	$156.87	$ 0.18	6.9	$ 156.87	July	698	6.9
	8/19/2009	9/17/2009	2009	$ 29.50	404.00	$ 43.70	$73.20	$ 0.18	5.9	$ 73.20	August	720	5.9
	9/18/2009	10/19/2009	2009	$ 35.72	503.00	$ 15.90	$51.62	$ 0.10	6.9	$ 51.62	September	433	6.9
	10/20/2009	11/17/2009	2009	$ 20.81	289.00	$ 31.26	$52.07	$ 0.18	2.9	$ 52.07	October	418	2.9
	11/18/2009	12/17/2009	2009	$ 11.17	105.00	$ 11.36	$22.53	$ 0.21	6.9	$ 22.53	November	215	6.9

Month	Use (KWH)	Demand (KW)
January	866.87	5.25
February	742.91	5.25
March	683.40	5.10
April	515.77	4.70
May	310.41	4.95
June	504.58	6.25
July	1137.50	6.30
August	975.15	5.65
September	549.06	6.10
October	356.91	2.50
November	228.39	4.55
December	248.34	2.10
Total	7119	

Electric Bills - Glassboro J. Harvey Rodgers School												
Atlantic City Electric Account# 0222 5479 9954 , Meter # 80592346												
Comments	Service From	Service To	Year	Atlantic City Electric Charges	South Jersey Supply Charge	Total Charge	kWh	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/7/2007	1/8/2008	2007	$ 4,509.52		$ 4,509.52	30240	$ 0.15	144.8	~~December~~	~~22909~~	~~144.8~~
	1/9/2008	2/6/2008	2008	$ 4,880.51		$ 4,880.51	34800	$ 0.14	144.8	January	34931	144.8
	2/7/2008	3/7/2008	2008	$ 4,568.28		$ 4,568.28	31680	$ 0.14	144.8	Febuary	31233	144.8
	3/8/2008	4/8/2008	2008	$ 4,575.08		$ 4,575.08	30960	$ 0.15	144.8	March	30867	144.8
	4/9/2008	5/7/2008	2008	$ 4,001.75		$ 4,001.75	26720	$ 0.15	144.8	April	28010	144.8
	5/8/2008	6/6/2008	2008	$ 4,393.62		$ 4,393.62	32240	$ 0.14	144.8	May	32242	144.8
	6/7/2008	7/8/2008	2008	$ 6,732.43		$ 6,732.43	42000	$ 0.16	142.4	June	37948	142.4
	7/9/2008	8/6/2008	2008	$ 7,102.28		$ 7,102.28	45280	$ 0.16	148.0	July	46412	148.0
	8/7/2008	9/5/2008	2008	$ 5,481.12		$ 5,481.12	32880	$ 0.17	148.0	August	36768	148.0
	9/6/2008	10/7/2008	2008	$ 6,484.02		$ 6,484.02	37840	$ 0.17	212.8	September	35043	212.8
	10/8/2008	11/5/2008	2008	$ 4,155.59		$ 4,155.59	28160	$ 0.15	148.0	October	31582	148.0
	11/6/2008	12/6/2008	2008	$ 4,319.14		$ 4,319.14	28880	$ 0.15	148.0	November	28145	148.0
	12/7/2008	1/8/2009	2009	$ 4,703.18		$ 4,703.18	31520.00	$ 0.15	148.0	December	29468	148.0
	1/9/2009	2/5/2009	2009	$ 4,128.01		$ 4,128.01	27520.00	$ 0.15	148.0	January	30247	148.0
	2/6/2009	3/9/2009	2009	$ 4,397.23		$ 4,397.23	28560.00	$ 0.15	148.0	Febuary	25442	148.0
	3/10/2009	4/7/2009	2009	$ 4,343.84		$ 4,343.84	29120.00	$ 0.15	148.0	March	30124	148.0
	4/8/2009	5/18/2009	2009	$ 1,489.22	$ 3,617.99	$ 5,107.21	34480.00	$ 0.15	148.0	April	26371	148.0
	5/19/2009	6/17/2009	2009	$ 1,317.56	$ 3,752.30	$ 5,069.86	35760.00	$ 0.14	148.0	May	30634	148.0
	6/18/2009	7/17/2009	2009	$ 1,347.23		$ 1,347.23	30560.00	$ 0.04	148.0	June	33507	148.0
	7/18/2009	8/17/2009	2009	$ 1,421.18	$ 3,519.89	$ 4,941.07	33440.00	$ 0.15	148.0	July	32419	148.0
	8/18/2009	9/16/2009	2009	$ 1,403.89	$ 3,604.10	$ 5,007.99	34240.00	$ 0.15	148.0	August	34317	148.0
	9/17/2009	10/16/2009	2009	$ 1,283.81	$ 2,820.97	$ 4,104.78	26800.00	$ 0.15	148.0	September	30768	148.0
	10/17/2009	11/16/2009	2009	$ 1,270.93	$ 2,576.76	$ 3,847.69	24480.00	$ 0.16	148.0	October	26138	148.0
	11/17/2009	12/16/2009	2009	$ 1,310.47	$ 3,073.59	$ 4,384.06	29200.00	$ 0.15	148.0	November	26262	148.0

Month	Use (KWH)	Demand (KW)
January	32589	146.4
February	28337	146.4
March	30495	146.4
April	27191	146.4
May	31438	146.4
June	35727	145.2
July	39415	148.0
August	35543	148.0
September	32905	180.4
October	28860	148.0
November	27204	148.0
December	29468	148.0
Total	**379173**	**1797.6**

Electric Bills - Glassboro Thomas E. Bowe School

Atlantic City Electric Account# 1068 2249 9963 , Meter # 82890644

Comments	Service From	Service To	Year	Atlantic City Electric Charges	South Jersey Supply Charges	kWh	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	11/28/2008	12/26/2008	2007	$ 3,754.88		27678	$ 0.14	92.9	December	30061	92.9
	12/27/2008	1/27/2008	2008	$ 4,508.23		33576	$ 0.13	96.3	January	32789	96.3
	1/28/2008	2/27/2008	2008	$ 4,589.46		34562	$ 0.13	95.6	Febuary	31185	95.6
	2/28/2008	3/30/2008	2008	$ 4,502.70		33568	$ 0.13	94.5	March	33405	94.5
	3/31/2008	4/28/2008	2008	$ 3,652.81		26684	$ 0.14	91.6	April	27380	91.6
	4/29/2008	5/28/2008	2008	$ 3,359.61		24238	$ 0.14	84.6	May	24848	84.6
	5/29/2008	6/26/2008	2008	$ 3,692.62		23001	$ 0.16	89.5	June	21770	89.5
	6/27/2008	7/28/2008	2008	$ 3,269.80		19827	$ 0.16	42.3	July	19122	42.3
	7/29/2008	8/26/2008	2008	$ 2,852.31		17147	$ 0.17	48.4	August	19945	48.4
	8/27/2008	9/25/2008	2008	$ 4,372.45		27428	$ 0.16	91.3	September	26737	91.3
	9/26/2008	10/27/2008	2008	$ 3,488.77		24836	$ 0.14	78.8	October	24134	78.8
	10/28/2008	11/25/2008	2008	$ 3,233.19		23048	$ 0.14	91.3	November	25130	91.3
	11/26/2008	12/28/2008	2008	$ 4,631.09		34720	$ 0.13	92.9	December	32434	92.9
	12/29/2008	1/27/2009	2009	$ 4,049.75		29751	$ 0.14	92.5	January	30772	92.5
	1/28/2009	2/26/2009	2009	$ 4,083.69		29968	$ 0.14	93.2	Febuary	27992	93.2
	2/27/2009	3/29/2009	2009	$ 4,256.97		31302	$ 0.14	93.2	March	31237	93.2
	3/30/2009	4/28/2009	2009	$ 823.80		29178	$ 0.03	92.3	April	29159	92.3
	4/29/2009	5/28/2009	2009	$ 818.61		28897	$ 0.03	91.4	May	29346	91.4
	5/29/2009	6/28/2009	2009	$ 925.43		24550	$ 0.04	85.7	June	23296	85.7
	6/29/2009	7/28/2009	2009	$ 745.58	$ 1,771.74	16832	$ 0.15	41.2	July	17146	41.2
	7/29/2009	8/26/2009	2009	$ 685.15	$ 1,461.54	13885	$ 0.15	42.7	August	15441	42.7
	8/27/2009	9/27/2009	2009	$ 871.74	$ 2,016.04	19153	$ 0.15	83.9	September	18141	83.9
	9/28/2009	10/26/2009	2009	$ 757.73	$ 2,015.41	19147	$ 0.14	74.7	October	20466	74.7
	10/27/2009	11/24/2009	2009	$ 842.87	$ 2,014.36	19137	$ 0.15	91.6	~~November~~	~~15837.52+~~	~~91.6~~

Electric Bills - Glassboro Thomas E. Bowe School

Atlantic City Electric Account # 0068 8109 9979, Meter #93485195

Comments	Service From	Service To	Year	Atlantic City Electric Charges	South Jersey Supply Charges	Total Charge	kWh	Cost Per KWH	Measured Demand (kW)	Month	Adjusted Monthly kWh	Adjusted Monthly kW
	12/5/2007	1/4/2008	2008	$7,393.58		$7,393.58	54000.00	$0.14	100.80	~~December~~	~~48600~~	~~100.80~~
	1/5/2008	2/4/2008	2008	$7,367.75		$7,367.75	53600.00	$0.14	111.20	January	53883.87	111.20
	2/5/2008	3/5/2008	2008	$6,934.52		$6,934.52	50080.00	$0.14	121.60	Febuary	48592.19	121.60
	3/6/2008	4/4/2008	2008	$6,383.85		$6,383.85	44960.00	$0.14	128.00	March	47599.81	128.00
	4/5/2008	5/5/2008	2008	$6,539.00		$6,539.00	45840.00	$0.14	137.60	April	44441.12	137.60
	5/6/2008	6/4/2008	2008	$7,309.94		$7,309.94	54640.00	$0.13	208.80	May	54748.22	208.80
	6/5/2008	7/3/2008	2008	$11,701.95		$11,701.95	75920.00	$0.15	221.60	June	75351.54	221.60
	7/4/2008	8/4/2008	2008	$11,995.59		$11,995.59	78640.00	$0.15	188.80	July	76663.79	188.80
	8/5/2008	9/3/2008	2008	$10,619.88		$10,619.88	69600.00	$0.15	174.40	August	72470.00	174.40
	9/4/2008	10/3/2008	2008	$9,687.62		$9,687.62	62480.00	$0.16	202.40	September	63393.55	202.40
	10/4/2008	11/3/2008	2008	$6,784.89		$6,784.89	49280.00	$0.14	164.00	October	50706.45	164.00
	11/4/2008	12/4/2008	2008	$6,308.49		$6,308.49	44880.00	$0.14	104.00	November	43709.00	104.00
	12/5/2008	1/6/2009	2009	$7,791.76		$7,791.76	57440.00	$0.14	100.80	December	52787.33	100.80
	1/7/2009	2/3/2009	2009	$7,108.90		$7,108.90	52480.00	$0.14	122.40	January	57300.78	122.40
	2/4/2009	3/5/2009	2009	$7,115.86		$7,115.86	51760.00	$0.14	109.60	Febuary	48756.19	109.60
	3/6/2009	4/3/2009	2009	$6,590.08		$6,590.08	47440.00	$0.14	106.40	March	51159.08	106.40
	4/4/2009	5/19/2009	2009	$2,216.31	$7,403.86	$9,620.17	70560.00	$0.14	168.00	April	46323.24	168.00
	5/20/2009	6/18/2009	2009	$1,939.73	$6,816.25	$8,755.98	64960.00	$0.13	188.80	May	55128.35	188.80
	6/19/2009	7/20/2009	2009	$2,064.26	$6,390.90	$8,455.16	60320.00	$0.14	163.20	June	61596.00	163.20
	7/21/2009	8/18/2009	2009	$2,099.29	$7,486.09	$9,585.38	71120.00	$0.13	172.80	July	64676.55	172.80
	8/19/2009	9/17/2009	2009	$2,435.00	$7,065.05	$9,500.05	67120.00	$0.14	240.80	August	73228.78	240.80
	9/18/2009	10/19/2009	2009	$2,014.79	$5,524.04	$7,538.83	52480.00	$0.14	180.80	September	59354.67	180.80
	10/20/2009	11/17/2009	2009	$1,828.04	$5,220.90	$7,048.94	49600.00	$0.14	123.20	October	51684.14	123.20
	11/18/2009	12/17/2009	2009	$1,851.97	$5,178.79	$7,030.76	49200.00	$0.14	106.40	November	50395.86	106.40

Month	Use (KWH)	Demand (KW)
January	87373	211
February	78263	210
March	81700	222
April	73652	230
May	82035	297
June	91007	309
July	88805	231
August	90542	220
September	83813	290
October	73495	241
November	72182	195
December	84035	194
Total	**986902**	

Gas Bills for Plots - Administration Building							
			South Jersey Gas Account # 2 14 37 0011 0 6				
Comments	Month	Year	Delivery Charges Meter # 0272443	Utility Supply Charges Pepco	Total Gas Charges	Total Therms	Cost Per Therm
	January	2007	$ -	$ -	$ -	-	-
	February	2007	$ -	$ -	$ -	-	-
	March	2007	$ -	$ -	$ -	-	-
	April	2007	$ -	$ -	$ -	-	-
	May	2007	$ -	$ -	$ -	-	-
	June	2007	$ -	$ -	$ -	-	-
	July	2007	$ -	$ -	$ -	-	-
	August	2007	$ -	$ -	$ -	-	-
	September	2007	$ -	$ -	$ -	-	-
	October	2007	$ -	$ -	$ -	-	-
	November	2007	$ -	$ -	$ -	-	-
	~~December~~	~~2007~~	~~$ 196.09~~	~~$ -~~	~~$ 593.53~~	445	~~$ 1.33~~
	January	2008	$ 239.22	$ -	$ 725.57	544	$ 1.33
	February	2008	$ 231.26	$ -	$ 703.39	528	$ 1.33
	March	2008	$ 173.44	$ -	$ 508.41	381	$ 1.33
	April	2008	$ 85.11	$ -	$ 218.98	164	$ 1.33
BGSS delivery for this month	May	2008	$ 96.28	$ -	$ 30.70	72	$ 0.42
	June	2008	$ 35.31	$ 23.78	$ 45.77	24	$ 1.93
	July	2008	$ 26.91	$ 31.27	$ 58.18	19	$ 2.99
	August	2008	$ 27.30	$ 26.20	$ 53.50	20	$ 2.65
	September	2008	$ 26.55	$ 22.64	$ 49.19	20	$ 2.50
	October	2008	$ 56.52	$ 94.21	$ 150.73	92	$ 1.64
	November	2008	$ 137.29	$ 320.57	$ 457.87	290	$ 1.58
	December	2008	$ 20.33	$ 494.60	$ 68.75	458	$ 0.15
	January	2009	$ -	$ 705.55	$ -	659	$ -
	February	2009	$ -	$ 587.82	$ -	536	$ -
	March	2009	$ -	$ 597.61	$ -	541	$ -
	April	2009	$ -	$ 109.44	$ -	99	$ -
	May	2009	$ 17.40	$ 14.78	$ 35.03	13	$ 2.72
	June	2009	$ 28.92	$ 26.10	$ 55.02	23	$ 2.37
	July	2009	$ 27.69	$ 20.43	$ 48.12	19	$ 2.53
	August	2009	$ 27.62	$ 18.97	$ 46.59	19	$ 2.48
	September	2009	$ 27.59	$ 17.79	$ 45.38	20	$ 2.28
	October	2009	$ 73.10	$ 104.73	$ 177.83	121	$ 1.47
	November	2009	$ 104.37	$ 165.27	$ 269.64	193	$ 1.40
	~~December~~	~~2009~~	~~$ 48.73~~	~~$ 74.44~~	~~$ 123.17~~	89	~~$ 1.39~~

Month	Combined (Therms)
January	602
February	532
March	461
April	132
May	43
June	23
July	19
August	20
September	20
October	106
November	241
December	458
Total	**2657**

Gas Bills for Plots - Dorothy Bullock School							
			South Jersey Energy Account # 2 14 35 0028 0 8				
Comments	Month	Year	Delivery Charges Meter # 0341226	Utility Supply Charges Pepco	Total Gas Charges	Total Therms	Cost Per Therm
	January	2007	$ -	$ -	$ -	-	-
	February	2007	$ -	$ -	$ -	-	-
	March	2007	$ -	$ -	$ -	-	-
	April	2007	$ -	$ -	$ -	-	-
	May	2007	$ -	$ -	$ -	-	-
	June	2007	$ -	$ -	$ -	-	-
	July	2007	$ -	$ -	$ -	-	-
	August	2007	$ -	$ -	$ -	-	-
	September	2007	$ -	$ -	$ -	-	-
	October	2007	$ -	$ -	$ -	-	-
	November	2007	$ -	$ -	$ -	-	-
	~~December~~	~~2007~~	~~$ 3,132.55~~	~~$ -~~	~~$ 10,285.18~~	~~7,715~~	~~$ 1.33~~
	January	2008	$ 3,702.53	$ -	$ 12,153.58	9,117	$ 1.33
	February	2008	$ 3,478.83	$ -	$ 11,419.56	8,566	$ 1.33
	March	2008	$ 2,265.44	$ -	$ 7,411.56	5,560	$ 1.33
	April	2008	$ 879.13	$ -	$ 2,839.20	2,130	$ 1.33
BGSS delivery for this month	May	2008	$ 1,897.06	$ -	$ 411.40	1,324	$ 0.31
	June	2008	$ 450.12	$ 256.05	$ 337.83	377	$ 0.90
	July	2008	$ 86.82	$ 275.27	$ 362.09	167	$ 2.16
	August	2008	$ 93.72	$ 243.60	$ 337.32	184	$ 1.83
	September	2008	$ 181.60	$ 474.81	$ 656.42	403	$ 1.63
	October	2008	$ 1,120.35	$ 2,797.83	$ 3,918.18	2,713	$ 1.44
	November	2008	$ 2,644.02	$ 7,080.97	$ 9,724.99	6,422	$ 1.51
	December	2008	$ 494.91	$ 9,984.16	$ 1,830.75	9,239	$ 0.20
	January	2009	$ -	$ 12,561.67	$ -	11,728	$ -
	February	2009	$ -	$ 9,579.72	$ -	8,740	$ -
	March	2009	$ -	$ 7,276.14	$ -	6,592	$ -
	April	2009	$ -	$ 3,369.09	$ -	3,052	$ -
	May	2009	$ 87.01	$ 1,491.77	$ 286.66	1,346	$ 0.21
	June	2009	$ 139.89	$ 311.08	$ 450.98	276	$ 1.63
	July	2009	$ 105.64	$ 212.89	$ 318.53	197	$ 1.62
	August	2009	$ 112.33	$ 212.98	$ 325.31	211	$ 1.54
	September	2009	$ 274.82	$ 494.70	$ 769.52	571	$ 1.35
	October	2009	$ 1,161.51	$ 2,211.35	$ 3,372.86	2,566	$ 1.31
	November	2009	$ 2,443.91	$ 4,656.68	$ 7,100.59	5,465	$ 1.30
	~~December~~	~~2009~~	~~$ 1,665.40~~	~~$ 3,137.72~~	~~$ 4,803.11~~	~~3,730~~	~~$ 1.29~~

Month	Combined (Therms)
January	10422
February	8653
March	6076
April	2591
May	1335
June	326
July	182
August	198
September	487
October	2639
November	5943
December	9239
Total	**48093**

Gas Bills for Plots - Elsmere School							
			South Jersey Energy Account #				
			2 14 43 0080 0 4				
Comments	Month	Year	Delivery Charges Meter # 0515726	Utility Supply Charges Pepco	Total Gas Charges	Total Therms	Cost Per Therm
	January	2007	$ -	$ -	$ -	-	-
	February	2007	$ -	$ -	$ -	-	-
	March	2007	$ -	$ -	$ -	-	-
	April	2007	$ -	$ -	$ -	-	-
	May	2007	$ -	$ -	$ -	-	-
	June	2007	$ -	$ -	$ -	-	-
	July	2007	$ -	$ -	$ -	-	-
	August	2007	$ -	$ -	$ -	-	-
	September	2007	$ -	$ -	$ -	-	-
	October	2007	$ -	$ -	$ -	-	-
	November	2007	$ -	$ -	$ -	-	-
	~~December~~	~~2007~~	~~$ 192.78~~	~~$ -~~	~~$ 580.54~~	~~436~~	~~$ 1.33~~
	January	2008	$ 301.20	$ -	$ 930.00	698	$ 1.33
	February	2008	$ 266.87	$ -	$ 856.46	642	$ 1.33
	March	2008	$ 245.26	$ -	$ 752.61	565	$ 1.33
	April	2008	$ 168.56	$ -	$ 494.45	371	$ 1.33
BGSS delivery for this month	May	2008	$ 400.94	$ -	$ 77.15	266	$ 0.29
	June	2008	$ 77.72	$ 15.41	$ 35.53	42	$ 0.85
	July	2008	$ 24.41	$ 21.31	$ 45.72	13	$ 3.65
	August	2008	$ 24.49	$ 17.05	$ 41.54	13	$ 3.26
	September	2008	$ 23.75	$ 14.92	$ 38.66	12	$ 3.11
	October	2008	$ 137.37	$ 298.93	$ 436.30	291	$ 1.50
	November	2008	$ 220.94	$ 546.07	$ 767.01	495	$ 1.55
	December	2008	$ 23.27	$ 814.21	$ 81.37	755	$ 0.11
	January	2009	$ -	$ 1,002.90	$ -	936	$ -
	February	2009	$ -	$ 866.35	$ -	788	$ -
	March	2009	$ -	$ 701.44	$ -	636	$ -
	April	2009	$ -	$ 330.12	$ -	299	$ -
	May	2009	$ 12.85	$ 155.75	$ 20.34	141	$ 0.14
	June	2009	$ 24.42	$ 14.06	$ 38.48	12	$ 3.10
	July	2009	$ 25.16	$ 14.25	$ 39.41	13	$ 3.04
	August	2009	$ 24.48	$ 13.09	$ 37.57	12	$ 3.01
	September	2009	$ 31.38	$ 24.44	$ 55.82	28	$ 1.98
	October	2009	$ 129.28	$ 213.56	$ 342.84	247	$ 1.39
	November	2009	$ 247.49	$ 439.92	$ 687.41	515	$ 1.33
	~~December~~	~~2009~~	~~$ 151.23~~	~~$ 267.77~~	~~$ 418.99~~	~~318~~	~~$ 1.32~~

Month	Combined (Therms)
January	817
February	715
March	600
April	335
May	203
June	27
July	13
August	13
September	20
October	269
November	505
December	755
Total	**4273**

Gas Bills for Plots - High School							
			South Jersey Energy Account #				
			2 14 37 0010 0 7				
Comments	Month	Year	Delivery Charges Meter # 222228	Utility Supply Charges Pepco	Total Gas Charges	Total Therms	Cost Per Therm
	January	2007	$ -	$ -	$ -	-	-
	February	2007	$ -	$ -	$ -	-	-
	March	2007	$ -	$ -	$ -	-	-
	April	2007	$ -	$ -	$ -	-	-
	May	2007	$ -	$ -	$ -	-	-
	June	2007	$ -	$ -	$ -	-	-
	July	2007	$ -	$ -	$ -	-	-
	August	2007	$ -	$ -	$ -	-	-
	September	2007	$ -	$ -	$ -	-	-
	October	2007	$ -	$ -	$ -	-	-
	November	2007	$ -	$ -	$ -	-	-
	~~December~~	~~2007~~	~~$ 4,195.37~~	~~$ -~~	~~$ 13,790.08~~	~~10,344~~	~~$ 1.33~~
	January	2008	$ 5,131.39	$ -	$ 16,868.39	12,654	$ 1.33
	February	2008	$ 4,523.20	$ -	$ 14,865.67	11,151	$ 1.33
	March	2008	$ 3,726.58	$ -	$ 12,232.99	9,176	$ 1.33
	April	2008	$ 1,609.83	$ -	$ 5,250.23	3,938	$ 1.33
BGSS delivery for this month	May	2008	$ 2,285.58	$ -	$ 696.68	1,715	$ 0.41
	June	2008	$ 1,017.11	$ 2,574.87	$ 3,260.66	1,849	$ 1.76
	July	2008	$ 579.87	$ 2,276.92	$ 2,856.79	1,388	$ 2.06
	August	2008	$ 458.11	$ 1,463.44	$ 1,921.55	1,086	$ 1.77
	September	2008	$ 1,712.84	$ 4,926.48	$ 6,639.31	4,193	$ 1.58
	October	2008	$ 1,133.79	$ 2,958.36	$ 4,092.14	2,751	$ 1.49
	November	2008	$ 3,439.68	$ 9,264.76	$ 12,704.45	8,365	$ 1.52
	December	2008	$ 526.29	$ 14,758.71	$ 1,949.11	13,673	$ 0.14
	January	2009	$ -	$ 16,578.97	$ -	15,477	$ -
	February	2009	$ -	$ 14,493.64	$ -	13,210	$ -
	March	2009	$ -	$ 12,407.31	$ -	11,241	$ -
	April	2009	$ -	$ 4,797.32	$ -	4,346	$ -
	May	2009	$ 879.11	$ 3,848.45	$ 3,130.16	3,429	$ 0.91
	June	2009	$ 1,289.58	$ 3,261.43	$ 4,551.00	2,898	$ 1.57
	July	2009	$ 747.00	$ 1,802.99	$ 2,549.99	1,658	$ 1.54
	August	2009	$ 378.13	$ 848.21	$ 1,226.34	777	$ 1.58
	September	2009	$ 690.99	$ 1,207.72	$ 1,898.71	1,374	$ 1.38
	October	2009	$ 1,998.31	$ 3,727.79	$ 5,726.09	4,347	$ 1.32
	November	2009	$ 3,522.93	$ 6,711.22	$ 10,234.15	7,896	$ 1.30
	~~December~~	~~2009~~	~~$ 2,248.58~~	~~$ 4,243.22~~	~~$ 6,491.80~~	~~5,044~~	~~$ 1.29~~

Month	Combined (Therms)
January	14065
February	12180
March	10209
April	4142
May	2572
June	2374
July	1523
August	931
September	2784
October	3549
November	8131
December	13673
Total	**76133**

Gas Bills for Plots - Intermediate School

South Jersey Energy Account # 2 14 39 0013 0 2

Comments	Month	Year	Delivery Charges Meter # 0190057	Utility Supply Charges Pepco	Total Gas Charges	Total Therms	Cost Per Therm
	January	2007	$ -	$ -	$ -	-	-
	February	2007	$ -	$ -	$ -	-	-
	March	2007	$ -	$ -	$ -	-	-
	April	2007	$ -	$ -	$ -	-	-
	May	2007	$ -	$ -	$ -	-	-
	June	2007	$ -	$ -	$ -	-	-
	July	2007	$ -	$ -	$ -	-	-
	August	2007	$ -	$ -	$ -	-	-
	September	2007	$ -	$ -	$ -	-	-
	October	2007	$ -	$ -	$ -	-	-
	November	2007	$ -	$ -	$ -	-	-
	~~December~~	~~2007~~	~~$ 3,375.44~~	~~$ -~~	~~$ 11,082.46~~	~~8,313~~	~~$ 1.33~~
	January	2008	$ 4,097.05	$ -	$ 13,455.33	10,093	$ 1.33
	February	2008	$ 3,734.53	$ -	$ 12,263.20	9,199	$ 1.33
	March	2008	$ 2,969.20	$ -	$ 9,498.66	7,125	$ 1.33
	April	2008	$ 1,650.68	$ -	$ 5,321.72	3,992	$ 1.33
BGSS delivery for this month	May	2008	$ 4,580.81	$ -	$ 724.02	3,067	$ 0.24
	June	2008	$ 1,550.36	$ 3,317.68	$ 4,197.54	2,526	$ 1.66
	July	2008	$ 920.07	$ 3,731.36	$ 4,651.43	2,229	$ 2.09
	August	2008	$ 961.80	$ 2,958.08	$ 3,919.88	2,333	$ 1.68
	September	2008	$ 223.10	$ 611.97	$ 835.07	506	$ 1.65
	October	2008	$ 2,472.53	$ 6,212.51	$ 8,685.04	6,053	$ 1.43
	November	2008	$ 2,809.21	$ 7,531.78	$ 10,340.99	6,827	$ 1.51
	December	2008	$ 282.87	$ 10,749.67	$ 1,046.21	9,967	$ 0.10
	January	2009	$ -	$ 13,699.15	$ -	12,792	$ -
	February	2009	$ -	$ 11,154.74	$ -	10,146	$ -
	March	2009	$ -	$ 8,115.97	$ -	7,353	$ -
	April	2009	$ -	$ 4,784.10	$ -	4,334	$ -
	May	2009	$ 560.11	$ 3,687.70	$ 1,985.00	3,305	$ 0.60
	June	2009	$ 1,024.10	$ 2,572.62	$ 3,596.72	2,293	$ 1.57
	July	2009	$ 946.88	$ 2,290.79	$ 3,237.67	2,113	$ 1.53
	August	2009	$ 911.48	$ 2,058.36	$ 2,969.84	2,026	$ 1.47
	September	2009	$ 1,183.68	$ 2,322.05	$ 3,505.73	2,606	$ 1.35
	October	2009	$ 1,794.98	$ 3,400.97	$ 5,195.95	3,975	$ 1.31
	November	2009	$ 2,443.06	$ 4,661.33	$ 7,104.40	5,463	$ 1.30
	~~December~~	~~2009~~	~~$ 1,551.14~~	~~$ 2,921.41~~	~~$ 4,472.55~~	~~3,473~~	~~$ 1.29~~

Month	Combined (Therms)
January	11443
February	9673
March	7239
April	4163
May	3186
June	2409
July	2171
August	2179
September	1556
October	5014
November	6145
December	9967
Total	**65145**

Gas Bills for Plots - Intermediate School Annex							
			South Jersey Energy Account # 2 14 39 0001 0 6				
Comments	Month	Year	Delivery Charges Meter # 0437626	Utility Supply Charges Pepco	Total Gas Charges	Total Therms	Cost Per Therm
	January	2007	$ -	$ -	$ -	-	-
	February	2007	$ -	$ -	$ -	-	-
	March	2007	$ -	$ -	$ -	-	-
	April	2007	$ -	$ -	$ -	-	-
	May	2007	$ -	$ -	$ -	-	-
	June	2007	$ -	$ -	$ -	-	-
	July	2007	$ -	$ -	$ -	-	-
	August	2007	$ -	$ -	$ -	-	-
	September	2007	$ -	$ -	$ -	-	-
	October	2007	$ -	$ -	$ -	-	-
	November	2007	$ -	$ -	$ -	-	-
	~~December~~	~~2007~~	~~$ 154.98~~	~~$ -~~	~~$ 455.85~~	~~342~~	~~$ 1.33~~
	January	2008	$ 170.80	$ -	$ 499.69	375	$ 1.33
	February	2008	$ 159.10	$ -	$ 465.29	349	$ 1.33
	March	2008	$ 140.76	$ -	$ 400.56	301	$ 1.33
	April	2008	$ 93.19	$ -	$ 245.72	184	$ 1.33
BGSS delivery for this month	May	2008	$ 129.15	$ -	$ 38.66	101	$ 0.38
	June	2008	$ 37.70	$ 15.41	$ 35.53	21	$ 1.71
	July	2008	$ 23.67	$ 18.59	$ 42.26	11	$ 3.94
	August	2008	$ 38.37	$ 59.38	$ 97.75	47	$ 2.08
	September	2008	$ 77.12	$ 169.96	$ 247.08	145	$ 1.71
	October	2008	$ 72.74	$ 94.77	$ 167.51	90	$ 1.86
	November	2008	$ 122.95	$ 277.48	$ 400.43	250	$ 1.60
	December	2008	$ 12.89	$ 323.32	$ 42.81	300	$ 0.14
	January	2009	$ -	$ 408.78	$ -	382	$ -
	February	2009	$ -	$ 354.31	$ -	322	$ -
	March	2009	$ -	$ 272.40	$ -	247	$ -
	April	2009	$ -	$ 159.76	$ -	145	$ -
	May	2009	$ 25.39	$ 115.45	$ 65.53	103	$ 0.63
	June	2009	$ 37.05	$ 47.76	$ 84.81	42	$ 2.03
	July	2009	$ 23.96	$ 11.78	$ 35.74	11	$ 3.40
	August	2009	$ 24.01	$ 11.22	$ 35.23	11	$ 3.32
	September	2009	$ 27.99	$ 18.37	$ 46.36	21	$ 2.24
	October	2009	$ 69.50	$ 97.40	$ 166.89	113	$ 1.48
	November	2009	$ 108.73	$ 172.93	$ 281.66	203	$ 1.39
	~~December~~	~~2009~~	~~$ 63.47~~	~~$ 101.17~~	~~$ 164.64~~	~~121~~	~~$ 1.37~~

Month	Combined (Therm)
January	378
February	336
March	274
April	165
May	102
June	31
July	11
August	29
September	83
October	101
November	227
December	300
Total	**2035**

Gas Bills for Plots - J. Harvey Rodgers School							
			South Jersey Energy Account # 2 15 31 0220 0 8				
Comments	Month	Year	Delivery Charges Meter # 0422455	Utility Supply Charges Pepco	Total Gas Charges	Total Therms	Cost Per Therm
	January	2007	$ -	$ -	$ -	-	-
	February	2007	$ -	$ -	$ -	-	-
	March	2007	$ -	$ -	$ -	-	-
	April	2007	$ -	$ -	$ -	-	-
	May	2007	$ -	$ -	$ -	-	-
	June	2007	$ -	$ -	$ -	-	-
	July	2007	$ -	$ -	$ -	-	-
	August	2007	$ -	$ -	$ -	-	-
	September	2007	$ -	$ -	$ -	-	-
	October	2007	$ -	$ -	$ -	-	-
	November	2007	$ -	$ -	$ -	-	-
	~~December~~	~~2007~~	~~$ 1,515.55~~	~~$ -~~	~~$ 4,949.58~~	~~3,713~~	~~$ 1.33~~
	January	2008	$ 1,768.62	$ -	$ 5,772.10	4,330	$ 1.33
	February	2008	$ 1,659.51	$ -	$ 5,503.99	4,129	$ 1.33
	March	2008	$ 1,410.85	$ -	$ 4,618.28	3,464	$ 1.33
	April	2008	$ 648.63	$ -	$ 2,078.54	1,559	$ 1.33
BGSS delivery for this month	May	2008	$ 1,006.82	$ -	$ 223.99	703	$ 0.32
	June	2008	$ 196.63	$ 139.33	$ 191.99	172	$ 1.11
	July	2008	$ 54.93	$ 146.35	$ 201.27	88	$ 2.29
	August	2008	$ 56.02	$ 118.49	$ 174.52	91	$ 1.92
	September	2008	$ 71.79	$ 154.59	$ 226.37	131	$ 1.72
	October	2008	$ 444.73	$ 1,079.87	$ 1,524.60	1,049	$ 1.45
	November	2008	$ 1,236.91	$ 3,296.15	$ 4,533.07	2,979	$ 1.52
	December	2008	$ 179.71	$ 4,923.35	$ 661.03	4,561	$ 0.14
	January	2009	$ -	$ 5,936.84	$ -	5,543	$ -
	February	2009	$ -	$ 4,994.22	$ -	4,547	$ -
	March	2009	$ -	$ 3,514.98	$ -	3,185	$ -
	April	2009	$ -	$ 1,904.40	$ -	1,725	$ -
	May	2009	$ 47.07	$ 860.29	$ 141.48	777	$ 0.18
	June	2009	$ 74.86	$ 143.88	$ 218.74	128	$ 1.71
	July	2009	$ 63.53	$ 109.11	$ 172.64	101	$ 1.72
	August	2009	$ 61.07	$ 95.36	$ 156.43	95	$ 1.65
	September	2009	$ 109.90	$ 175.99	$ 285.89	203	$ 1.41
	October	2009	$ 560.88	$ 1,051.98	$ 1,612.86	1,218	$ 1.32
	November	2009	$ 1,111.37	$ 2,094.50	$ 3,205.87	2,462	$ 1.30
	~~December~~	~~2009~~	~~$ 635.57~~	~~$ 1,187.04~~	~~$ 1,822.61~~	~~1,411~~	~~$ 1.29~~

Month	Combined (Therms)
January	4937
February	4338
March	3324
April	1642
May	740
June	150
July	94
August	93
September	167
October	1133
November	2721
December	4561
Total	**23901**

Gas Bills for Plots - Thomas E. Bowe School							
			South Jersey Energy Account # 2 14 43 0081 0 3				
Comments	Month	Year	Delivery Charges Meter # 0431189	Utility Supply Charges Pepco	Total Gas Charges	Total Therms	Cost Per Therm
	January	2007	$ -	$ -	$ -	-	-
	February	2007	$ -	$ -	$ -	-	-
	March	2007	$ -	$ -	$ -	-	-
	April	2007	$ -	$ -	$ -	-	-
	May	2007	$ -	$ -	$ -	-	-
	June	2007	$ -	$ -	$ -	-	-
	July	2007	$ -	$ -	$ -	-	-
	August	2007	$ -	$ -	$ -	-	-
	September	2007	$ -	$ -	$ -	-	-
	October	2007	$ -	$ -	$ -	-	-
	November	2007	$ -	$ -	$ -	-	-
	~~December~~	~~2007~~	~~$ 3,202.04~~	~~$ -~~	~~$ 10,510.39~~	~~7,884~~	~~$ 1.33~~
	January	2008	$ 3,512.14	$ -	$ 11,525.37	8,646	$ 1.33
	February	2008	$ 3,012.57	$ -	$ 10,156.71	7,619	$ 1.33
	March	2008	$ 2,790.24	$ -	$ 9,198.42	6,900	$ 1.33
	April	2008	$ 1,675.73	$ -	$ 5,467.74	4,102	$ 1.33
BGSS delivery for this month	May	2008	$ 3,504.83	$ -	$ 341.24	2,226	$ 0.15
	June	2008	$ 589.67	$ 399.30	$ 519.97	529	$ 0.98
	July	2008	$ 99.14	$ 329.62	$ 428.76	197	$ 2.17
	August	2008	$ 115.66	$ 301.97	$ 417.64	238	$ 1.75
	September	2008	$ 180.07	$ 469.28	$ 649.35	399	$ 1.63
	October	2008	$ 1,173.21	$ 2,924.06	$ 4,097.26	2,847	$ 1.44
	November	2008	$ 1,758.35	$ 4,703.93	$ 6,462.27	4,255	$ 1.52
	December	2008	$ 121.35	$ 9,135.79	$ 447.63	8,480	$ 0.05
	January	2009	$ -	$ 10,264.79	$ -	9,590	$ -
	February	2009	$ -	$ 8,809.34	$ -	8,000	$ -
	March	2009	$ -	$ 6,694.31	$ -	6,065	$ -
	April	2009	$ -	$ 3,223.25	$ -	2,920	$ -
	May	2009	$ 312.77	$ 2,294.99	$ 1,096.94	2,059	$ 0.53
	June	2009	$ 470.71	$ 1,159.96	$ 1,630.67	1,030	$ 1.58
	July	2009	$ 303.86	$ 701.17	$ 1,005.03	648	$ 1.55
	August	2009	$ 277.85	$ 598.21	$ 876.06	588	$ 1.49
	September	2009	$ 573.41	$ 1,074.69	$ 1,648.10	1,237	$ 1.33
	October	2009	$ 1,357.43	$ 2,568.47	$ 3,925.90	2,998	$ 1.31
	November	2009	$ 2,066.55	$ 3,937.74	$ 6,004.29	4,614	$ 1.30
	~~December~~	~~2009~~	~~$ 1,304.42~~	~~$ 2,453.48~~	~~$ 3,757.90~~	~~2,917~~	~~$ 1.29~~

Month	Combined (Therms)
January	9118
February	7810
March	6483
April	3511
May	2142
June	779
July	423
August	413
September	818
October	2923
November	4435
December	8480
Total	**47334**

APPENDIX B

STATEMENT OF ENERGY PERFORMANCE SUMMARY SHEETS

PORTFOLIO MANAGER REFERENCE GUIDE

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
High School

Building ID: 2254885
For 12-month Period Ending: November 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: April 29, 2010

Facility
High School
550 Bowe Boulevard
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

Year Built: 1966
Gross Floor Area (ft^2): 113,915

Energy Performance Rating[2] (1-100) 18

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	5,346,649
Natural Gas (kBtu)[4]	8,032,605
Total Energy (kBtu)	13,379,254

Energy Intensity[5]	
Site (kBtu/ft^2/yr)	117
Source (kBtu/ft^2/yr)	231

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	1,242

Electric Distribution Utility
Pepco - Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	86
National Average Source EUI	169
% Difference from National Average Source EUI	36%
Building Type	K-12 School

Stamp of Certifying Professional

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

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

Certifying Professional
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	High School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	550 Bowe Boulevard, 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		☐

High School (K-12 School)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	113,915 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.		☐
Open Weekends?	Yes	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	391	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		☐

High School?	Yes	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		☐

Energy Consumption

Power Generation Plant or Distribution Utility: Pepco - Atlantic City Electric Co

Fuel Type: Electricity		
Meter: 91707232 (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/17/2009	11/13/2009	1,684.00
09/17/2009	10/16/2009	17,540.00
08/18/2009	09/16/2009	1,729.00
07/18/2009	08/17/2009	690.00
06/18/2009	07/17/2009	881.00
05/19/2009	06/17/2009	522.00
04/08/2009	05/18/2009	269.00
03/10/2009	04/07/2009	312.00
02/06/2009	03/09/2009	310.00
01/09/2009	02/05/2009	338.00
12/07/2008	01/08/2009	645.00
91707232 Consumption (kWh (thousand Watt-hours))		**24,920.00**
91707232 Consumption (kBtu (thousand Btu))		**85,027.04**
Meter: 83996178 (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/07/2009	11/06/2009	87,300.00
09/07/2009	10/06/2009	127,200.00
08/07/2009	09/06/2009	155,700.00
07/07/2009	08/06/2009	143,100.00
06/07/2009	07/06/2009	144,300.00
05/07/2009	06/06/2009	156,900.00
04/07/2009	05/06/2009	145,500.00
03/07/2009	04/06/2009	111,000.00
02/07/2009	03/06/2009	115,500.00
01/07/2009	02/06/2009	115,500.00
12/07/2008	01/06/2009	129,000.00
83996178 Consumption (kWh (thousand Watt-hours))		**1,431,000.00**
83996178 Consumption (kBtu (thousand Btu))		**4,882,572.00**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**4,967,599.04**

Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?	☐

Fuel Type: Natural Gas		
Meter: 222228 (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
10/17/2009	11/13/2009	5,463.00
09/17/2009	10/16/2009	2,662.00
08/18/2009	09/16/2009	246.00
07/18/2009	08/17/2009	1,207.00
06/17/2009	07/17/2009	2,029.00
05/16/2009	06/16/2009	3,964.00
04/07/2009	05/15/2009	3,763.00
03/07/2009	04/06/2009	10,493.00
02/06/2009	03/06/2009	13,434.00
01/08/2009	02/05/2009	14,819.00
12/05/2008	01/07/2009	15,606.00
222228 Consumption (therms)		**73,686.00**
222228 Consumption (kBtu (thousand Btu))		**7,368,600.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**7,368,600.00**
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
High School
550 Bowe Boulevard
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

General Information

High School	
Gross Floor Area Excluding Parking: (ft²)	113,915
Year Built	1966
For 12-month Evaluation Period Ending Date:	November 30, 2009

Facility Space Use Summary

High School	
Space Type	K-12 School
Gross Floor Area(ft^2)	113,915
Open Weekends?	Yes
Number of PCs	391
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months[o]	12
High School?	Yes
School District[o]	Glassboro

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 11/30/2009)	**Baseline** (Ending Date 11/30/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	18	18	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	117	117	67	N/A	86
Source (kBtu/ft²)	231	231	132	N/A	169
Energy Cost					
$/year	$ 237,508.86	$ 237,508.86	$ 136,418.46	N/A	$ 174,456.27
$/ft²/year	$ 2.08	$ 2.08	$ 1.19	N/A	$ 1.53
Greenhouse Gas Emissions					
$MtCO_2e$/year	1,242	1,242	713	N/A	912
$kgCO_2e/ft^2$/year	11	11	6	N/A	8

More than 50% of your building is defined as K-12 School. 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
Intermediate School

Building ID: 2259406
For 12-month Period Ending: November 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: April 30, 2010

Facility
Intermediate School
202 N. Delsea Drive
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

Year Built: 1929
Gross Floor Area (ft^2): 66,941

Energy Performance Rating[2] (1-100) 13

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	3,201,343
Natural Gas (kBtu)[4]	6,836,867
Total Energy (kBtu)	10,038,210
Energy Intensity[5]	
Site (kBtu/ft^2/yr)	150
Source (kBtu/ft^2/yr)	267
Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	851
Electric Distribution Utility	
Pepco - Atlantic City Electric Co	
National Average Comparison	
National Average Site EUI	104
National Average Source EUI	185
% Difference from National Average Source EUI	45%
Building Type	K-12 School

Stamp of Certifying Professional

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

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

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

Certifying Professional
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	Intermediate School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	202 N. Delsea Drive, 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		☐

Intermediate School (K-12 School)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	60,671 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.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	220	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		☐

High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		☐

Annex (Other)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	6,270 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	70Hours(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	4(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 Consumption

Power Generation Plant or Distribution Utility: Pepco - Atlantic City Electric Co

Fuel Type: Electricity		
Meter: 80592174 (kWh (thousand Watt-hours)) **Space(s):** Intermediate School **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/20/2009	11/17/2009	60,300.00
09/18/2009	10/19/2009	116,400.00
08/19/2009	09/17/2009	102,300.00
07/20/2009	08/18/2009	98,700.00
06/19/2009	07/19/2009	108,900.00
05/19/2009	06/18/2009	118,800.00
04/07/2009	05/18/2009	102,600.00
03/07/2009	04/06/2009	73,200.00
02/05/2009	03/06/2009	12,900.00
01/08/2009	02/04/2009	41,400.00
12/06/2008	01/07/2009	60,900.00
80592174 Consumption (kWh (thousand Watt-hours))		**896,400.00**
80592174 Consumption (kBtu (thousand Btu))		**3,058,516.80**
Meter: 80799460 (kWh (thousand Watt-hours)) **Space(s):** Annex **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/06/2009	11/05/2009	289.00
09/06/2009	10/05/2009	503.00
08/06/2009	09/05/2009	404.00
07/06/2009	08/05/2009	878.00
06/06/2009	07/05/2009	584.00
05/06/2009	06/05/2009	581.00
04/06/2009	05/05/2009	674.00
03/06/2009	04/05/2009	686.00
02/06/2009	03/05/2009	729.00
01/06/2009	02/05/2009	834.00
12/06/2008	01/05/2009	263.00
80799460 Consumption (kWh (thousand Watt-hours))		**6,425.00**
80799460 Consumption (kBtu (thousand Btu))		**21,922.10**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**3,080,438.90**

Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?	☐

Fuel Type: Natural Gas		
Meter: 0190057 (therms) **Space(s):** Intermediate School		
Start Date	**End Date**	**Energy Use (therms)**
10/16/2009	11/16/2009	4,848.00
09/16/2009	10/15/2009	3,103.00
08/18/2009	09/15/2009	2,040.00
07/18/2009	08/17/2009	1,899.00
06/18/2009	07/17/2009	2,215.00
05/16/2009	06/17/2009	2,588.00
04/04/2009	05/15/2009	5,740.00
03/06/2009	04/03/2009	6,227.00
02/04/2009	03/05/2009	10,620.00
01/07/2009	02/03/2009	12,100.00
12/04/2008	01/06/2009	11,269.00
0190057 Consumption (therms)		**62,649.00**
0190057 Consumption (kBtu (thousand Btu))		**6,264,900.00**
Meter: 0437626 (therms) **Space(s):** Annex		
Start Date	**End Date**	**Energy Use (therms)**
10/04/2009	11/03/2009	195.00
09/04/2009	10/03/2009	31.00
08/04/2009	09/03/2009	10.00
07/04/2009	08/03/2009	10.00
06/04/2009	07/03/2009	10.00
05/04/2009	06/03/2009	72.00
04/04/2009	05/03/2009	191.00
03/04/2009	04/03/2009	212.00
02/04/2009	03/03/2009	340.00
01/04/2009	02/03/2009	362.00
12/04/2008	01/03/2009	331.00
0437626 Consumption (therms)		**1,764.00**
0437626 Consumption (kBtu (thousand Btu))		**176,400.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**6,441,300.00**
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
Intermediate School
202 N. Delsea Drive
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

General Information

Intermediate School	
Gross Floor Area Excluding Parking: (ft^2)	66,941
Year Built	1929
For 12-month Evaluation Period Ending Date:	November 30, 2009

Facility Space Use Summary

Intermediate School	
Space Type	K-12 School
Gross Floor Area(ft^2)	60,671
Open Weekends?	No
Number of PCs	220
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months[o]	12
High School?	No
School District[o]	Glassboro

Annex	
Space Type	Other - Education
Gross Floor Area(ft^2)	6,270
Number of PCs[o]	4
Weekly operating hours[o]	70
Workers on Main Shift[o]	4

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 11/30/2009)	**Baseline** (Ending Date 11/30/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	13	13	75	N/A	50
Energy Intensity					
Site (kBtu/ft2)	150	150	81	N/A	104
Source (kBtu/ft2)	267	267	144	N/A	185
Energy Cost					
$/year	$ 212,786.68	$ 212,786.68	$ 115,205.06	N/A	$ 147,316.04
$/ft2/year	$ 3.18	$ 3.18	$ 1.72	N/A	$ 2.20
Greenhouse Gas Emissions					
$MtCO_2e$/year	851	851	461	N/A	589
$kgCO_2e/ft^2$/year	13	13	7	N/A	9

More than 50% of your building is defined as K-12 School. 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

2009

Intermediate School
202 N. Delsea Drive
Glassboro, NJ 08028

Portfolio Manager Building ID: 2259406

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

This building's score

13

1 | 50 | 100

Least Efficient | Average | Most Efficient

This building uses 267 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending November 2009

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 04/30/2010

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Thomas E. Bowe School

Building ID: 2259013
For 12-month Period Ending: October 31, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: April 29, 2010

Facility
Thomas E. Bowe School
7 Ruth Mancuso Lane
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

Year Built: 1972
Gross Floor Area (ft^2): 75,514

Energy Performance Rating[2] (1-100) 21

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	3,297,373
Natural Gas (kBtu)[4]	4,787,072
Total Energy (kBtu)	8,084,445

Energy Intensity[5]	
Site (kBtu/ft^2/yr)	107
Source (kBtu/ft^2/yr)	212

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	757

Electric Distribution Utility
Pepco - Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	82
National Average Source EUI	163
% Difference from National Average Source EUI	31%
Building Type	K-12 School

Stamp of Certifying Professional

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

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

Certifying Professional
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	Thomas E. Bowe School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	7 Ruth Mancuso Lane, 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		☐

Bowe School (K-12 School)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	75,514 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.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	154	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		☐

High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		☐

Energy Consumption

Power Generation Plant or Distribution Utility: Pepco - Atlantic City Electric Co

Fuel Type: Electricity		
Meter: 82890644 (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
09/28/2009	10/26/2009	19,147.00
08/27/2009	09/27/2009	19,153.00
07/29/2009	08/26/2009	13,885.00
06/29/2009	07/28/2009	16,832.00
05/29/2009	06/28/2009	24,550.00
04/29/2009	05/28/2009	28,897.00
03/30/2009	04/28/2009	29,178.00
02/27/2009	03/29/2009	31,302.00
01/28/2009	02/26/2009	29,968.00
12/29/2008	01/27/2009	29,751.00
11/26/2008	12/28/2008	34,720.00
82890644 Consumption (kWh (thousand Watt-hours))		**277,383.00**
82890644 Consumption (kBtu (thousand Btu))		**946,430.80**
Meter: 93485195 (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
09/18/2009	10/19/2009	52,480.00
08/19/2009	09/17/2009	67,120.00
07/21/2009	08/18/2009	71,120.00
06/19/2009	07/20/2009	60,320.00
05/20/2009	06/18/2009	64,960.00
04/04/2009	05/19/2009	70,560.00
03/06/2009	04/03/2009	47,440.00
02/04/2009	03/05/2009	51,760.00
01/07/2009	02/03/2009	52,480.00
12/05/2008	01/06/2009	57,440.00
11/04/2008	12/04/2008	44,880.00
93485195 Consumption (kWh (thousand Watt-hours))		**640,560.00**
93485195 Consumption (kBtu (thousand Btu))		**2,185,590.72**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**3,132,021.52**

Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?	☐

Fuel Type: Natural Gas		
Meter: 0431189 (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
09/17/2009	10/16/2009	1,997.00
08/18/2009	09/16/2009	572.00
07/17/2009	08/17/2009	604.00
06/18/2009	07/16/2009	661.00
05/16/2009	06/17/2009	1,424.00
04/03/2009	05/15/2009	3,924.00
03/05/2009	04/02/2009	5,295.00
02/03/2009	03/04/2009	8,513.00
01/03/2009	02/02/2009	9,648.00
12/03/2008	01/02/2009	8,751.00
11/04/2008	12/02/2008	4,257.00
0431189 Consumption (therms)		**45,646.00**
0431189 Consumption (kBtu (thousand Btu))		**4,564,600.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**4,564,600.00**
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
Thomas E. Bowe School
7 Ruth Mancuso Lane
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

General Information

Thomas E. Bowe School	
Gross Floor Area Excluding Parking: (ft^2)	75,514
Year Built	1972
For 12-month Evaluation Period Ending Date:	October 31, 2009

Facility Space Use Summary

Bowe School	
Space Type	K-12 School
Gross Floor Area(ft^2)	75,514
Open Weekends?	No
Number of PCs	154
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months[o]	12
High School?	No
School District[o]	Glassboro

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 10/31/2009)	**Baseline** (Ending Date 11/30/2008)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	21	20	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	107	106	64	N/A	82
Source (kBtu/ft²)	212	215	127	N/A	163
Energy Cost					
$/year	$ 142,230.80	$ 204,747.42	$ 85,144.52	N/A	$ 108,871.79
$/ft²/year	$ 1.88	$ 2.71	$ 1.13	N/A	$ 1.44
Greenhouse Gas Emissions					
$MtCO_2e$/year	757	766	453	N/A	579
$kgCO_2e/ft^2$/year	10	10	6	N/A	8

More than 50% of your building is defined as K-12 School. 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.

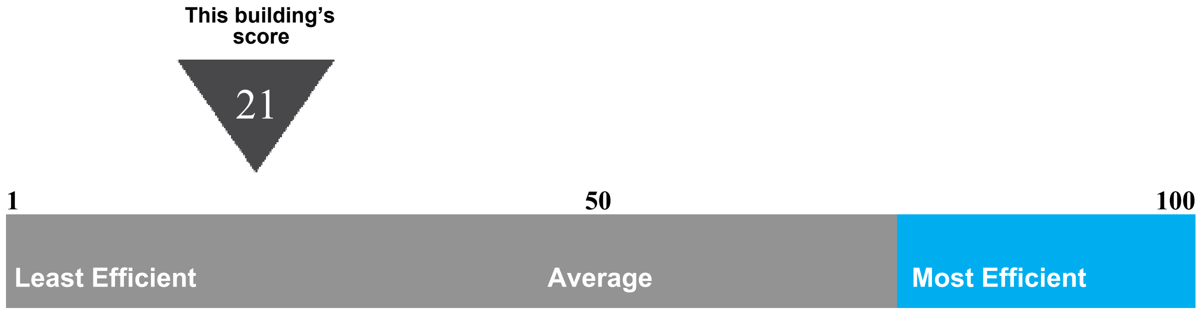
Statement of Energy Performance

2009

Thomas E. Bowe School
7 Ruth Mancuso Lane
Glassboro, NJ 08028

Portfolio Manager Building ID: 2259013

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



This building uses 212 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending October 2009

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 04/29/2010

Statement of Energy Performance

2009

Intermediate School Annex
202 N. Delsea Drive
Glassboro, NJ 08028

Portfolio Manager Building ID: 2259065

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

This building's score

100

1 | 50 | 100

Least Efficient | **Average** | **Most Efficient**

This building uses 45 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending November 2009

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 04/29/2010

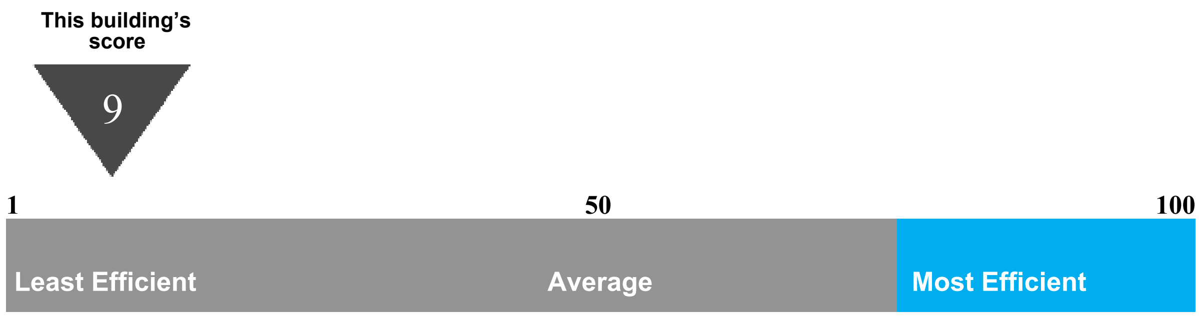
Statement of Energy Performance

2009

Intermediate School
202 N. Delsea Drive
Glassboro, NJ 08028

Portfolio Manager Building ID: 2259406

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



This building uses 290 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending November 2009

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 04/29/2010

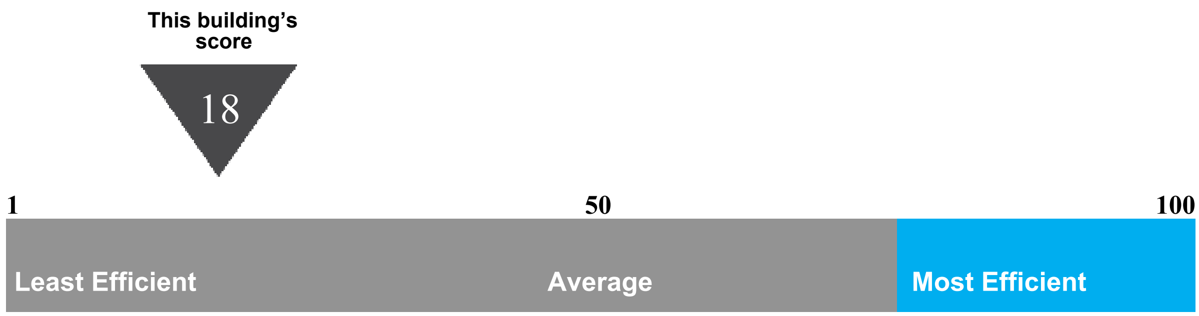
Statement of Energy Performance

2009

High School
550 Bowe Boulevard
Glassboro, NJ 08028

Portfolio Manager Building ID: 2254885

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



This building uses 231 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending November 2009

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 04/29/2010

STATEMENT OF ENERGY PERFORMANCE
Dorothy Bullock School

Building ID: 2258959
For 12-month Period Ending: November 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: April 29, 2010

Facility
Dorothy Bullock School
370 E. New St.
Glassboro, NY 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

Year Built: 1993
Gross Floor Area (ft²): 87,700

Energy Performance Rating[2] (1-100) 34

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	3,234,252
Natural Gas (kBtu)[4]	4,998,194
Total Energy (kBtu)	8,232,446

Energy Intensity[5]	
Site (kBtu/ft²/yr)	94
Source (kBtu/ft²/yr)	183

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	758

Electric Distribution Utility
Pepco - Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	82
National Average Source EUI	159
% Difference from National Average Source EUI	15%
Building Type	K-12 School

Stamp of Certifying Professional

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

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

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

Certifying Professional
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	Dorothy Bullock School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	370 E. New St., Glassboro, NY 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		☐

Bullock School (K-12 School)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	87,700 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.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	198	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		☐

High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		☐

ENERGY STAR® Data Checklist
for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Pepco - Atlantic City Electric Co

Fuel Type: Electricity		
Meter: 83995987 (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/17/2009	11/17/2009	29,400.00
09/18/2009	10/16/2009	109,800.00
08/19/2009	09/17/2009	100,200.00
07/21/2009	08/18/2009	110,400.00
06/19/2009	07/20/2009	99,300.00
05/20/2009	06/18/2009	104,700.00
04/09/2009	05/19/2009	95,700.00
03/11/2009	04/08/2009	59,700.00
02/07/2009	03/10/2009	66,000.00
01/10/2009	02/06/2009	63,300.00
12/09/2008	01/09/2009	68,400.00
83995987 Consumption (kWh (thousand Watt-hours))		**906,900.00**
83995987 Consumption (kBtu (thousand Btu))		**3,094,342.80**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**3,094,342.80**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: 0341226 (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
10/17/2009	11/16/2009	4,264.00
09/17/2009	10/16/2009	942.00
08/18/2009	09/16/2009	246.00
07/18/2009	08/17/2009	175.00
06/18/2009	07/17/2009	207.00
05/16/2009	06/17/2009	362.00
04/08/2009	05/15/2009	2,966.00
03/10/2009	04/07/2009	5,209.00
02/06/2009	03/09/2009	9,388.00
01/08/2009	02/05/2009	11,557.00
12/06/2008	01/07/2009	10,200.00

0341226 Consumption (therms)	**45,516.00**
0341226 Consumption (kBtu (thousand Btu))	**4,551,600.00**
Total Natural Gas Consumption (kBtu (thousand Btu))	**4,551,600.00**
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
Dorothy Bullock School
370 E. New St.
Glassboro, NY 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

General Information

Dorothy Bullock School	
Gross Floor Area Excluding Parking: (ft²)	87,700
Year Built	1993
For 12-month Evaluation Period Ending Date:	November 30, 2009

Facility Space Use Summary

Bullock School	
Space Type	K-12 School
Gross Floor Area(ft²)	87,700
Open Weekends?	No
Number of PCs	198
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months°	12
High School?	No
School District°	Glassboro

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 11/30/2009)	**Baseline** (Ending Date 01/31/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	34	32	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	94	94	64	N/A	82
Source (kBtu/ft²)	183	187	125	N/A	159
Energy Cost					
$/year	$ 191,000.53	$ 227,476.60	$ 130,141.62	N/A	$ 166,420.94
$/ft²/year	$ 2.18	$ 2.59	$ 1.49	N/A	$ 1.90
Greenhouse Gas Emissions					
$MtCO_2e$/year	758	776	516	N/A	660
$kgCO_2e$/ft²/year	9	9	6	N/A	8

More than 50% of your building is defined as K-12 School. 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.

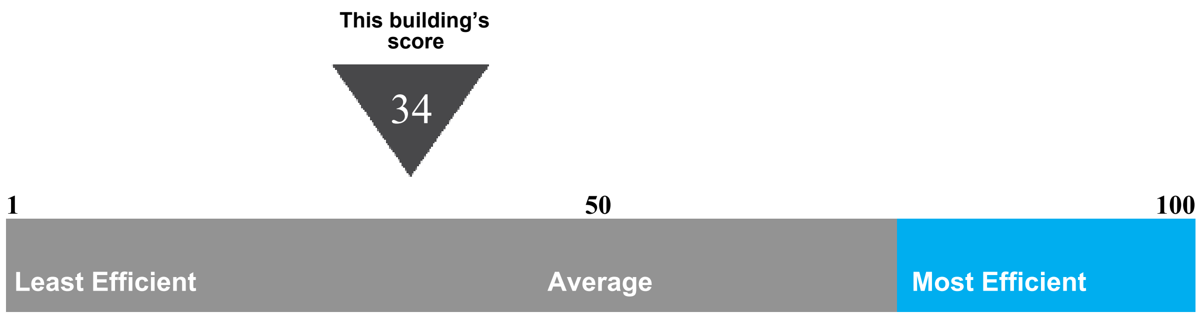
Statement of Energy Performance

2009

Dorothy Bullock School
370 E. New St.
Glassboro, NY 08028

Portfolio Manager Building ID: 2258959

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



This building uses 183 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending November 2009

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 04/29/2010

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
J. Harvey Rodgers School

Building ID: 2259233
For 12-month Period Ending: November 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: April 29, 2010

Facility
J. Harvey Rodgers School
301 Georgetown Road
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

Year Built: 1957
Gross Floor Area (ft²): 39,192

Energy Performance Rating[2] (1-100) 59

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	1,247,482
Natural Gas (kBtu)[4]	2,454,426
Total Energy (kBtu)	3,701,908

Energy Intensity[5]

Site (kBtu/ft²/yr)	94
Source (kBtu/ft²/yr)	172

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO$_2$e/year)	321

Electric Distribution Utility
Pepco - Atlantic City Electric Co

National Average Comparison

National Average Site EUI	103
National Average Source EUI	187
% Difference from National Average Source EUI	-8%
Building Type	K-12 School

Stamp of Certifying Professional

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

Meets Industry Standards[6] for Indoor Environmental Conditions:

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

Certifying Professional
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	J. Harvey Rodgers School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	301 Georgetown 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		☐

Rodgers School (K-12 School)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	39,192 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.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	77	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		☐

High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		☐

Energy Consumption

Power Generation Plant or Distribution Utility: Pepco - Atlantic City Electric Co

Fuel Type: Electricity

Meter: 80592346 (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
10/07/2009	11/06/2009	24,480.00
09/07/2009	10/06/2009	26,800.00
08/07/2009	09/06/2009	34,240.00
07/07/2009	08/06/2009	33,440.00
06/07/2009	07/06/2009	30,560.00
05/07/2009	06/06/2009	35,760.00
04/07/2009	05/06/2009	34,480.00
03/07/2009	04/06/2009	29,120.00
02/07/2009	03/06/2009	28,560.00
01/07/2009	02/06/2009	27,520.00
12/07/2008	01/06/2009	31,520.00
80592346 Consumption (kWh (thousand Watt-hours))		**336,480.00**
80592346 Consumption (kBtu (thousand Btu))		**1,148,069.76**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**1,148,069.76**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

Meter: 0422455 (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
10/16/2009	11/13/2009	1,925.00
09/16/2009	10/15/2009	311.00
08/15/2009	09/15/2009	101.00
07/17/2009	08/14/2009	85.00
06/17/2009	07/16/2009	107.00
05/15/2009	06/16/2009	161.00
04/07/2009	05/14/2009	1,883.00
03/07/2009	04/06/2009	2,769.00
02/05/2009	03/06/2009	4,759.00
01/07/2009	02/04/2009	5,366.00
12/05/2008	01/06/2009	5,045.00

0422455 Consumption (therms)	**22,512.00**
0422455 Consumption (kBtu (thousand Btu))	**2,251,200.00**
Total Natural Gas Consumption (kBtu (thousand Btu))	**2,251,200.00**
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
J. Harvey Rodgers School
301 Georgetown Road
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

General Information

J. Harvey Rodgers School	
Gross Floor Area Excluding Parking: (ft²)	39,192
Year Built	1957
For 12-month Evaluation Period Ending Date:	November 30, 2009

Facility Space Use Summary

Rodgers School	
Space Type	K-12 School
Gross Floor Area(ft²)	39,192
Open Weekends?	No
Number of PCs	77
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months°	12
High School?	No
School District°	Glassboro

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 11/30/2009)	**Baseline** (Ending Date 12/31/2008)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	59	55	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	94	94	81	N/A	103
Source (kBtu/ft²)	172	179	147	N/A	187
Energy Cost					
$/year	$ 57,824.10	$ 88,149.04	$ 49,309.03	N/A	$ 63,058.02
$/ft²/year	$ 1.48	$ 2.25	$ 1.26	N/A	$ 1.61
Greenhouse Gas Emissions					
$MtCO_2e$/year	321	333	274	N/A	350
$kgCO_2e$/ft²/year	8	8	7	N/A	9

More than 50% of your building is defined as K-12 School. 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.

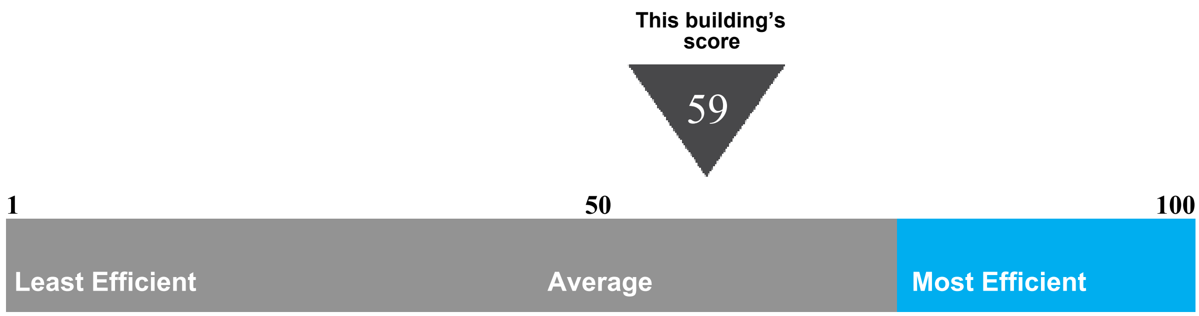
Statement of Energy Performance

2009

J. Harvey Rodgers School
301 Georgetown Road
Glassboro, NJ 08028

Portfolio Manager Building ID: 2259233

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



This building uses 172 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending November 2009

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 04/29/2010

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Elsmere School

Building ID: 2259142
For 12-month Period Ending: November 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: April 29, 2010

Facility
Elsmere School
801 Ellis Mill Road
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

Year Built: 1927
Gross Floor Area (ft²): 5,358

Energy Performance Rating[2] (1-100) 58

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	99,989
Natural Gas (kBtu)[4]	438,094
Total Energy (kBtu)	538,083
Energy Intensity[5]	
Site (kBtu/ft²/yr)	100
Source (kBtu/ft²/yr)	148
Emissions (based on site energy use)	
Greenhouse Gas Emissions (MtCO$_2$e/year)	39
Electric Distribution Utility	
Pepco - Atlantic City Electric Co	
National Average Comparison	
National Average Site EUI	108
National Average Source EUI	160
% Difference from National Average Source EUI	-7%
Building Type	K-12 School

Stamp of Certifying Professional

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

Meets Industry Standards[6] for Indoor Environmental Conditions:

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

Certifying Professional
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	Elsmere School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	801 Ellis Mill 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		☐

Elsmere (K-12 School)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	5,358 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.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	3	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	0	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	No	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		☐

High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		

Energy Consumption

Power Generation Plant or Distribution Utility: Pepco - Atlantic City Electric Co

Fuel Type: Electricity		
Meter: 94910909 (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/20/2009	11/17/2009	2,970.00
09/18/2009	10/19/2009	3,648.00
08/19/2009	09/17/2009	2,422.00
07/21/2009	08/18/2009	2,707.00
06/19/2009	07/20/2009	2,938.00
05/20/2009	06/18/2009	2,279.00
04/07/2009	05/19/2009	2,785.00
03/07/2009	04/06/2009	1,776.00
02/05/2009	03/06/2009	1,938.00
01/08/2009	02/04/2009	1,937.00
12/06/2008	01/07/2009	2,186.00
94910909 Consumption (kWh (thousand Watt-hours))		**27,586.00**
94910909 Consumption (kBtu (thousand Btu))		**94,123.43**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**94,123.43**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: 0515726 (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
10/17/2009	11/16/2009	459.00
09/17/2009	10/16/2009	47.00
08/19/2009	09/16/2009	11.00
07/20/2009	08/18/2009	12.00
06/18/2009	07/19/2009	13.00
05/16/2009	06/17/2009	13.00
04/04/2009	05/15/2009	376.00
03/06/2009	04/03/2009	554.00
02/04/2009	03/05/2009	832.00
01/07/2009	02/03/2009	880.00
12/04/2008	01/06/2009	853.00

0515726 Consumption (therms)	**4,050.00**
0515726 Consumption (kBtu (thousand Btu))	**405,000.00**
Total Natural Gas Consumption (kBtu (thousand Btu))	**405,000.00**
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
Elsmere School
801 Ellis Mill Road
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

General Information

Elsmere School	
Gross Floor Area Excluding Parking: (ft^2)	5,358
Year Built	1927
For 12-month Evaluation Period Ending Date:	November 30, 2009

Facility Space Use Summary

Elsmere	
Space Type	K-12 School
Gross Floor Area(ft^2)	5,358
Open Weekends?	No
Number of PCs	3
Number of walk-in refrigeration/freezer units	0
Presence of cooking facilities	No
Percent Cooled	100
Percent Heated	100
Months°	12
High School?	No
School District°	Glassboro

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 11/30/2009)	**Baseline** (Ending Date 12/31/2008)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	58	79	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	100	89	85	N/A	108
Source (kBtu/ft²)	148	118	125	N/A	160
Energy Cost					
$/year	$ 9,809.35	$ 8,772.14	$ 8,275.88	N/A	$ 10,582.92
$/ft²/year	$ 1.83	$ 1.64	$ 1.54	N/A	$ 1.97
Greenhouse Gas Emissions					
$MtCO_2e$/year	39	31	33	N/A	42
$kgCO_2e/ft^2$/year	7	6	6	N/A	8

More than 50% of your building is defined as K-12 School. 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.

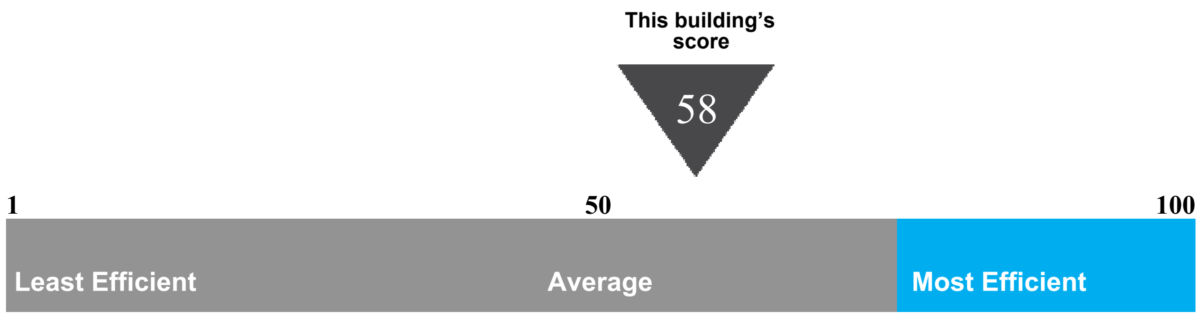
Statement of Energy Performance

2009

Elsmere School
801 Ellis Mill Road
Glassboro, NJ 08028

Portfolio Manager Building ID: 2259142

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



This building uses 148 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending November 2009

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 04/29/2010

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Beach Administration Building

Building ID: 2254925
For 12-month Period Ending: November 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: April 29, 2010

Facility
Beach Administration Building
560 Bowe Boulevard
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

Year Built: 1986
Gross Floor Area (ft²): 6,530

Energy Performance Rating[2] (1-100) 6

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	504,078
Natural Gas (kBtu)[4]	270,962
Total Energy (kBtu)	775,040

Energy Intensity[5]	
Site (kBtu/ft²/yr)	119
Source (kBtu/ft²/yr)	301

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	91

Electric Distribution Utility
Pepco - Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	65
National Average Source EUI	164
% Difference from National Average Source EUI	84%
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 Standards[6] for Indoor Environmental Conditions:	
Ventilation for Acceptable Indoor Air Quality	**N/A**
Acceptable Thermal Environmental Conditions	**N/A**
Adequate Illumination	**N/A**

Certifying Professional
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.
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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	Beach Administration Building	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	560 Bowe Boulevard, 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		☐

Administration Building (Office)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	6,530 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	50 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	15	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	20	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 Consumption

Power Generation Plant or Distribution Utility: Pepco - Atlantic City Electric Co

Fuel Type: Electricity		
Meter: 65330593 (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/17/2009	11/16/2009	90.00
09/17/2009	10/16/2009	96.00
08/18/2009	09/16/2009	60.00
07/18/2009	08/17/2009	140.00
06/18/2009	07/17/2009	36.00
05/19/2009	06/17/2009	70.00
04/08/2009	05/18/2009	201.00
03/10/2009	04/07/2009	153.00
02/06/2009	03/09/2009	175.00
01/09/2009	02/05/2009	324.00
12/07/2008	01/08/2009	160.00
65330593 Consumption (kWh (thousand Watt-hours))		**1,505.00**
65330593 Consumption (kBtu (thousand Btu))		**5,135.06**
Meter: 83450504 (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/07/2009	11/06/2009	690.00
09/07/2009	10/06/2009	1,012.00
08/07/2009	09/06/2009	1,006.00
07/07/2009	08/06/2009	484.00
06/07/2009	07/06/2009	343.00
05/07/2009	06/06/2009	409.00
04/07/2009	05/06/2009	854.00
03/07/2009	04/06/2009	231.00
02/07/2009	03/06/2009	99.00
01/07/2009	02/06/2009	99.00
12/07/2008	01/06/2009	235.00
83450504 Consumption (kWh (thousand Watt-hours))		**5,462.00**
83450504 Consumption (kBtu (thousand Btu))		**18,636.34**

Meter: 39887386 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/06/2009	11/05/2009	7.00
09/06/2009	10/05/2009	7.00
08/06/2009	09/05/2009	7.00
07/06/2009	08/05/2009	10.00
06/06/2009	07/05/2009	74.00
05/06/2009	06/05/2009	26.00
04/06/2009	05/05/2009	0.00
03/06/2009	04/05/2009	0.00
02/06/2009	03/05/2009	1.00
01/06/2009	02/05/2009	0.00
12/06/2008	01/05/2009	0.00
39887386 Consumption (kWh (thousand Watt-hours))		**132.00**
39887386 Consumption (kBtu (thousand Btu))		**450.38**

Meter: 105750809 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/05/2009	11/04/2009	17.00
09/05/2009	10/04/2009	9.00
08/05/2009	09/04/2009	3.00
07/05/2009	08/04/2009	2.00
06/05/2009	07/04/2009	17.00
05/05/2009	06/04/2009	40.00
04/05/2009	05/04/2009	31.00
03/05/2009	04/04/2009	141.00
02/05/2009	03/04/2009	2.00
01/05/2009	02/04/2009	35.00
12/05/2008	01/04/2009	8.00
105750809 Consumption (kWh (thousand Watt-hours))		**305.00**
105750809 Consumption (kBtu (thousand Btu))		**1,040.66**

Meter: 95162541 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
10/07/2009	11/06/2009	9,170.00
09/07/2009	10/06/2009	10,616.00
08/07/2009	09/06/2009	13,718.00
07/07/2009	08/06/2009	13,380.00
06/07/2009	07/06/2009	13,086.00
05/07/2009	06/06/2009	13,128.00
04/07/2009	05/06/2009	13,853.00

03/07/2009	04/06/2009	11,233.00
02/07/2009	03/06/2009	10,275.00
01/07/2009	02/06/2009	9,944.00
12/07/2008	01/06/2009	11,015.00
95162541 Consumption (kWh (thousand Watt-hours))		**129,418.00**
95162541 Consumption (kBtu (thousand Btu))		**441,574.22**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**466,836.66**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas		
Meter: 0272443 (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
10/16/2009	11/16/2009	220.00
09/16/2009	10/15/2009	22.00
08/15/2009	09/15/2009	19.00
07/17/2009	08/14/2009	18.00
06/17/2009	07/16/2009	19.00
05/15/2009	06/16/2009	30.00
04/07/2009	05/14/2009	1.00
03/07/2009	04/06/2009	535.00
02/06/2009	03/06/2009	531.00
01/08/2009	02/05/2009	666.00
12/05/2008	01/07/2009	522.00
0272443 Consumption (therms)		**2,583.00**
0272443 Consumption (kBtu (thousand Btu))		**258,300.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**258,300.00**
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
Beach Administration Building
560 Bowe Boulevard
Glassboro, NJ 08028

Facility Owner
Glassboro Board of Education
560 Bowe Boulevard
Glassboro, NJ 08028

Primary Contact for this Facility
Walter Pudelko
560 Bowe Boulevard
Glassboro, NJ 08028

General Information

Beach Administration Building	
Gross Floor Area Excluding Parking: (ft^2)	6,530
Year Built	1986
For 12-month Evaluation Period Ending Date:	November 30, 2009

Facility Space Use Summary

Administration Building	
Space Type	Office
Gross Floor Area(ft^2)	6,530
Weekly operating hours	50
Workers on Main Shift	15
Number of PCs	20
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 11/30/2009)	**Baseline** (Ending Date 11/30/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	6	6	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	119	119	48	N/A	65
Source (kBtu/ft²)	301	301	121	N/A	164
Energy Cost					
$/year	$ 22,165.95	$ 22,165.95	$ 8,908.21	N/A	$ 12,045.70
$/ft²/year	$ 3.39	$ 3.39	$ 1.36	N/A	$ 1.84
Greenhouse Gas Emissions					
$MtCO_2e$/year	91	91	37	N/A	49
$kgCO_2e/ft^2$/year	14	14	6	N/A	8

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.

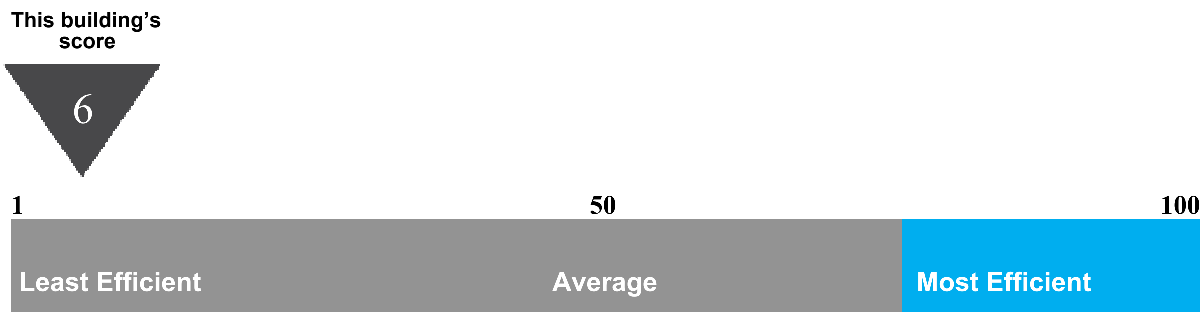
Statement of Energy Performance

2009

Beach Administration Building
560 Bowe Boulevard
Glassboro, NJ 08028

Portfolio Manager Building ID: 2254925

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



This building uses 301 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending November 2009

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

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

Date of certification

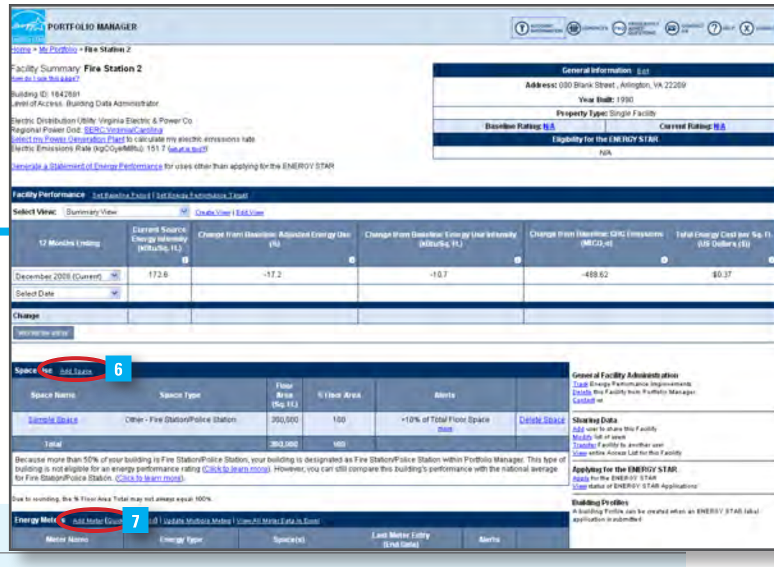
EPA United States Environmental Protection Agency

Date Generated: 04/29/2010

PORTFOLIO MANAGER QUICK REFERENCE GUIDE

ENERGY STAR

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.

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_portfoliomanager_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_portfoliomanager_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.

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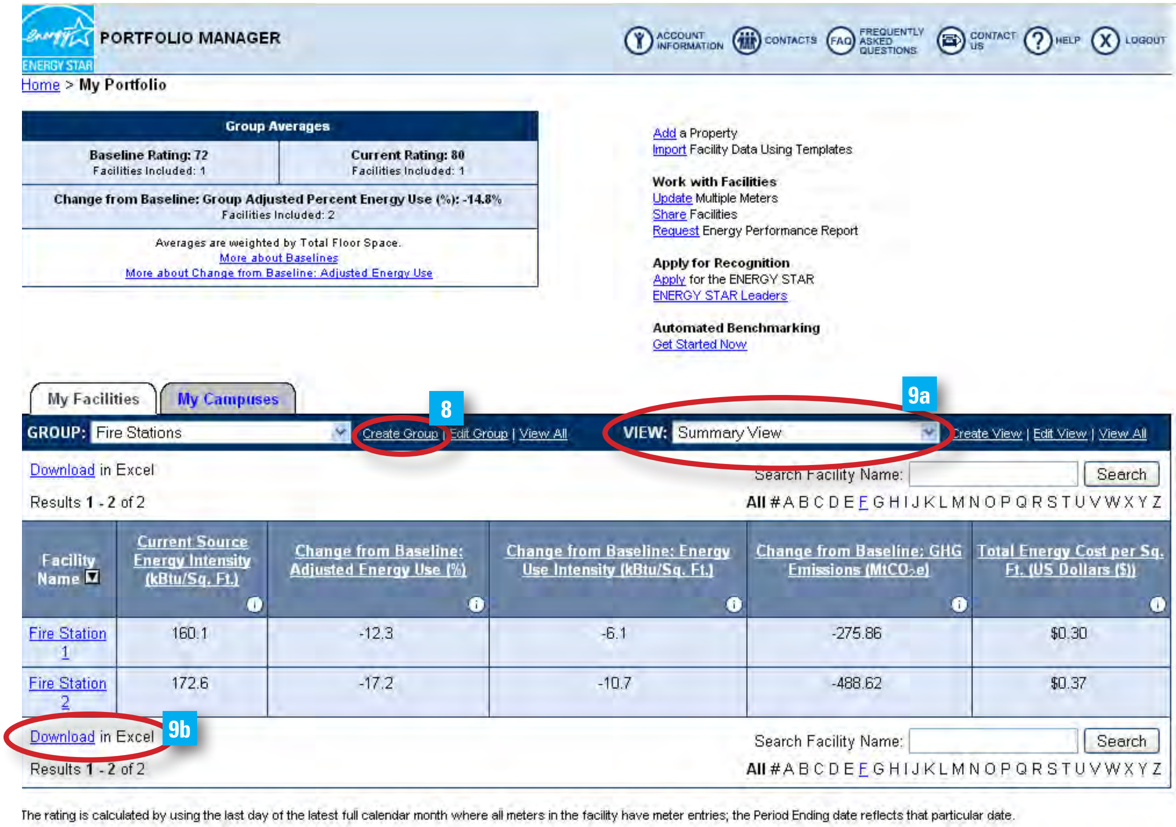
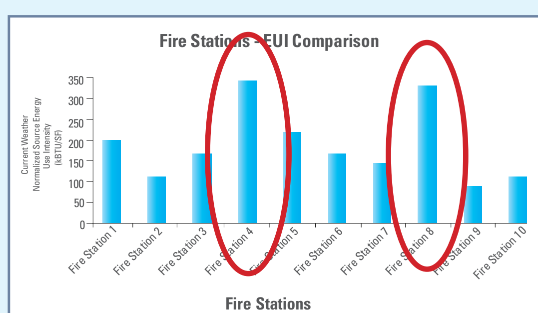


STEP	ACTIVITY	ACTION
8	Create custom groups.	Organize facilities into groups (e.g., Fire Stations, Northwest Region). Groups are completely customizable, and each facility may belong to multiple groups. • From the **My Portfolio** page, click **CREATE GROUP**, located directly to the right of the **Group** 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 eficiency improvements. 

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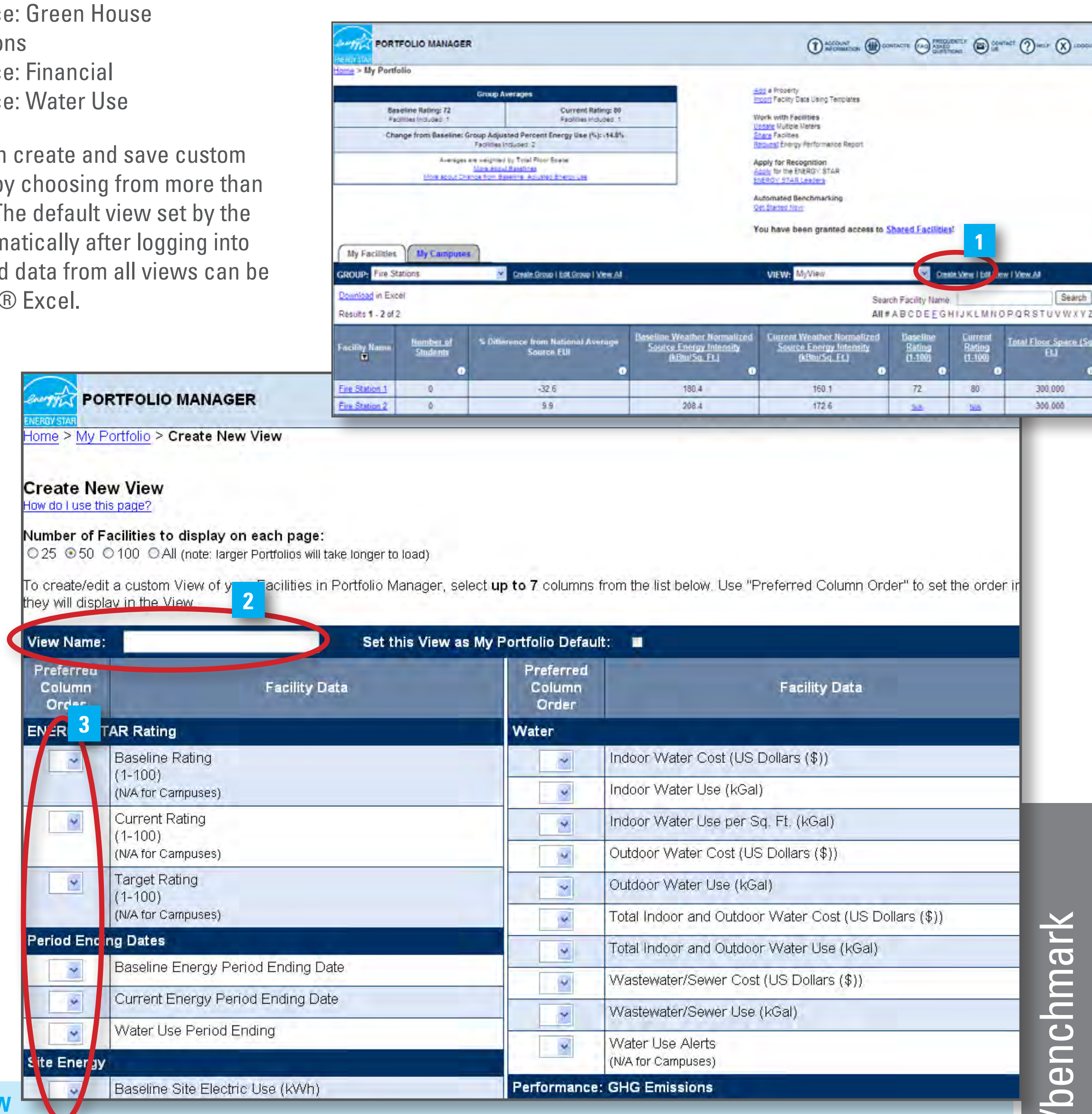
TRACK PROGRESS OVER TIME

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.



CREATE A CUSTOM VIEW

STEP	ACTION
1	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.
2	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.
3	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.
4	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)

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VERIFY AND DOCUMENT RESULTS

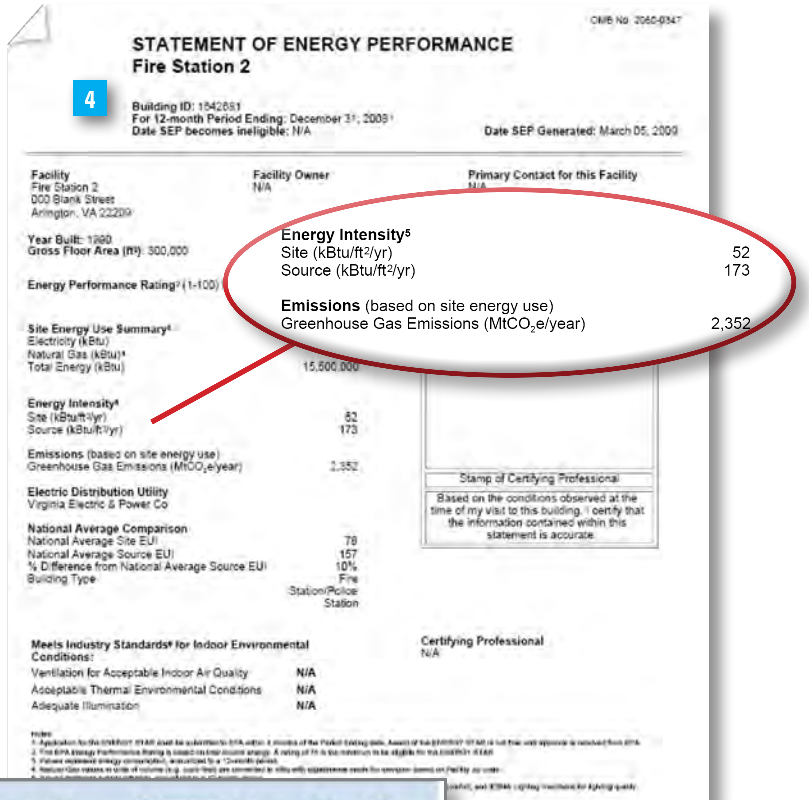
Use Portfolio Manager to quickly and accurately document reductions in energy use, greenhouse gas emissions, water use, and energy costs for an individual building or an entire portfolio. This valuable information can be used to provide a level of transparency and accountability to help demonstrate strategic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

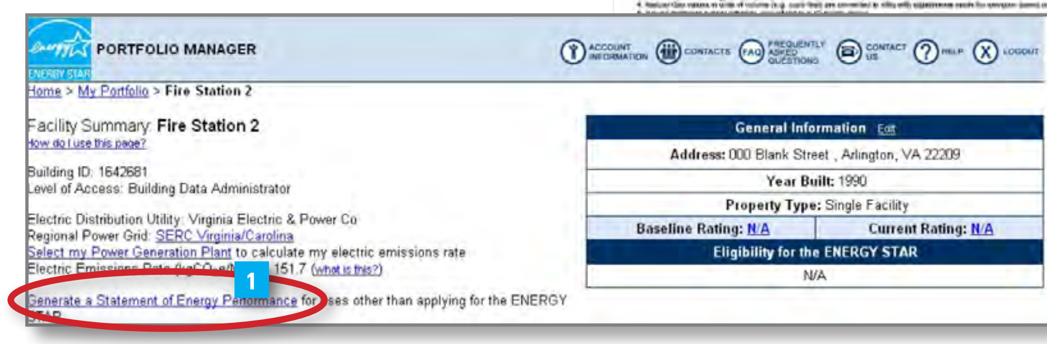
Generate a Statement of Energy Performance that includes valuable information about your building's performance, including:

- 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)





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)

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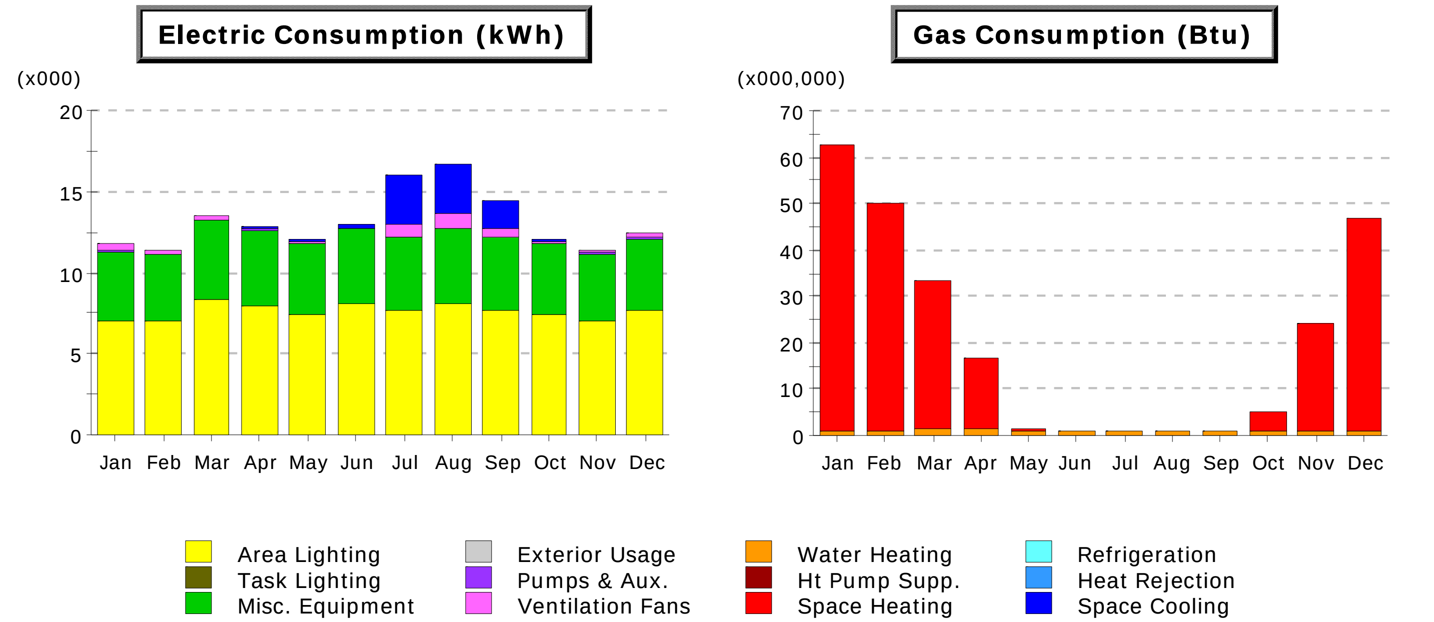
APPENDIX C eQUEST MODEL RUN

SUMMARIES

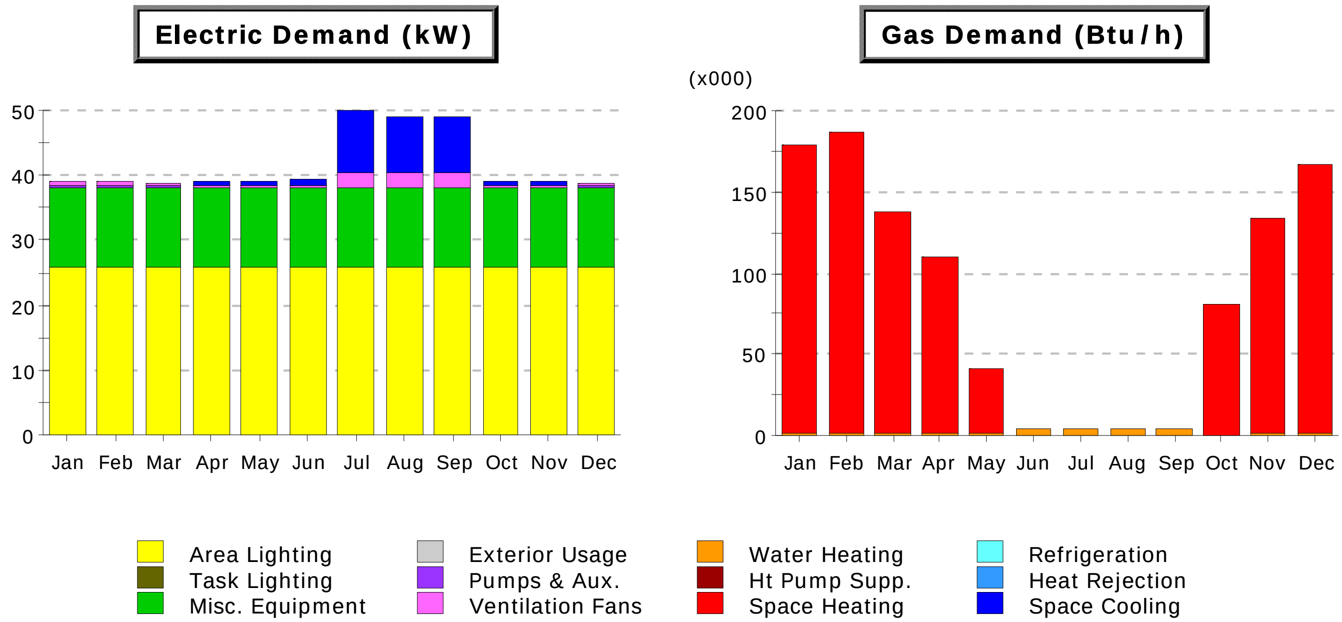


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.03	0.14	0.33	3.06	3.06	1.77	0.09	0.02	-	8.51
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.32	0.27	0.19	0.11	0.05	0.05	0.83	0.89	0.54	0.07	0.14	0.25	3.71
Pumps & Aux.	0.11	0.10	0.09	0.06	0.01	0.00	-	-	0.00	0.04	0.07	0.11	0.58
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	4.25	4.10	4.83	4.59	4.42	4.64	4.49	4.70	4.47	4.42	4.14	4.45	53.49
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.06	6.98	8.38	8.00	7.40	8.02	7.69	8.06	7.68	7.40	7.00	7.67	91.33
Total	11.74	11.44	13.49	12.79	12.02	13.05	16.07	16.72	14.46	12.01	11.37	12.48	157.63

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	61.42	49.10	32.06	15.47	0.24	-	-	-	-	4.03	23.21	45.78	231.30
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.06	1.08	1.28	1.20	1.03	1.02	0.94	0.94	0.89	0.88	0.91	1.07	12.30
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	62.48	50.17	33.34	16.67	1.27	1.02	0.94	0.94	0.89	4.91	24.11	46.84	243.60

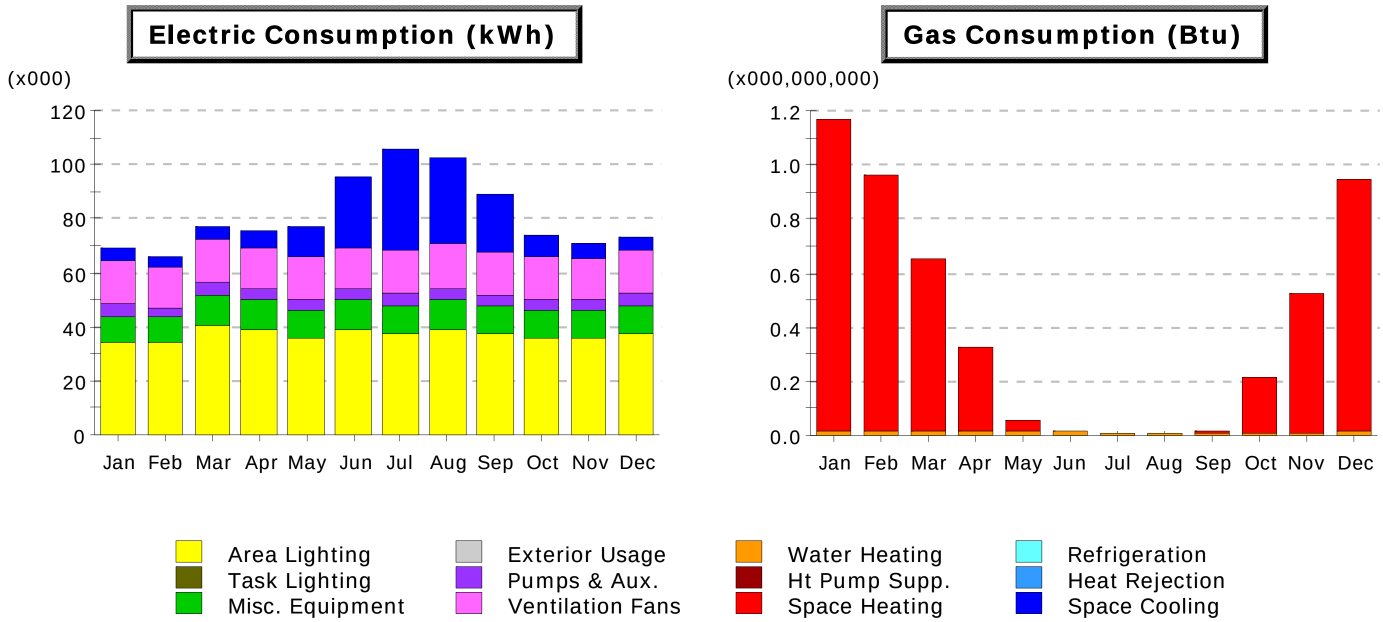


Electric Demand (kW)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.74	0.82	0.99	9.56	8.86	8.73	0.70	0.80	-	31.20
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.52	0.54	0.39	0.07	0.07	0.07	2.05	2.05	2.05	0.07	0.07	0.45	8.41
Pumps & Aux.	0.15	0.15	0.15	-	-	-	-	-	-	-	-	0.15	0.60
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	12.38	12.38	12.38	12.38	12.38	12.38	12.38	12.38	12.38	12.38	12.38	12.38	148.50
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	25.87	25.87	25.87	25.87	25.87	25.87	25.87	25.87	25.87	25.87	25.87	25.87	310.44
Total	38.91	38.93	38.79	39.06	39.13	39.31	49.85	49.16	49.03	39.02	39.11	38.84	499.15

Gas Demand (Btu/h x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	178.4	185.4	137.4	108.5	40.0	-	-	-	-	80.0	132.9	166.2	1,028.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.8	0.8	0.8	0.8	0.7	3.8	3.5	3.3	3.3	0.7	0.7	0.8	20.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	179.2	186.3	138.2	109.3	40.7	3.8	3.5	3.3	3.3	80.7	133.6	167.0	1,048.9

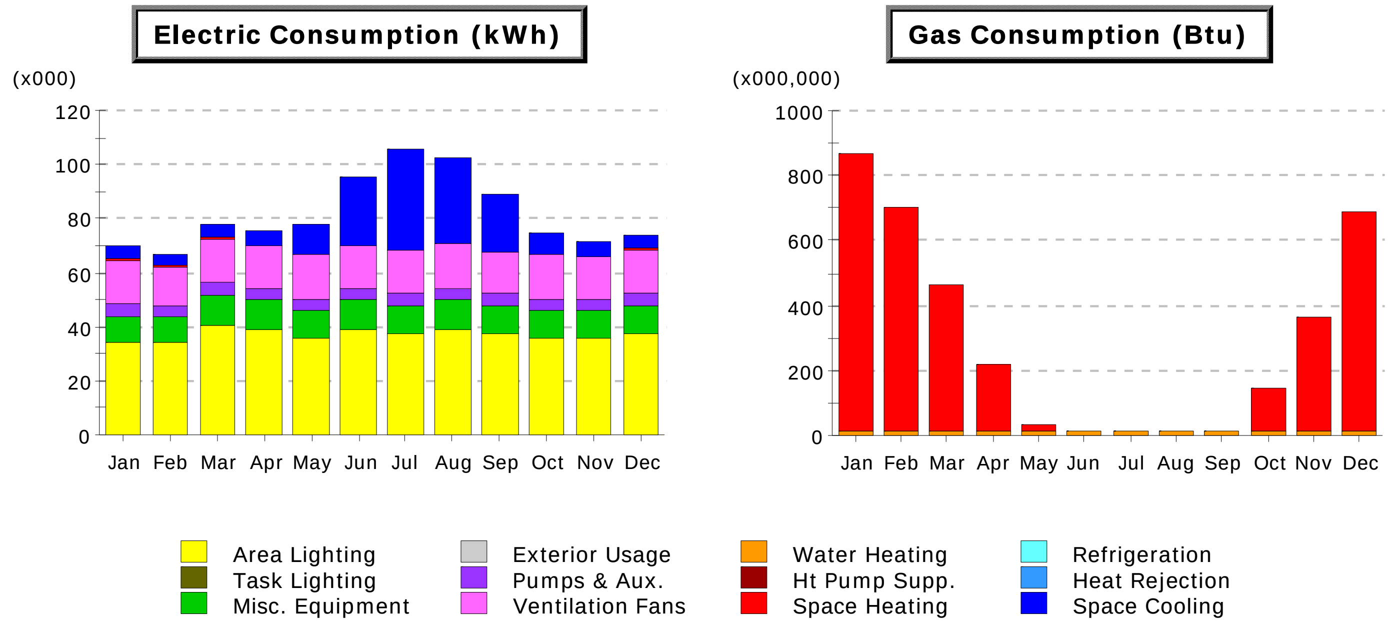


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	4.66	4.20	4.65	5.66	11.14	25.81	37.40	32.14	21.56	7.64	5.46	4.65	164.97
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	16.17	14.60	16.17	15.64	16.17	15.64	16.17	16.17	15.64	16.17	15.64	16.17	190.33
Pumps & Aux.	4.22	3.81	4.22	4.07	4.19	4.05	4.19	4.19	4.05	4.20	4.07	4.22	49.48
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	9.54	9.42	11.28	10.80	9.97	10.81	10.41	10.85	10.37	9.97	9.93	10.41	123.76
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	34.42	33.99	40.74	39.01	36.01	39.01	37.57	39.16	37.43	36.00	35.85	37.58	446.78
Total	69.00	66.02	77.06	75.19	77.47	95.33	105.73	102.51	89.06	73.97	70.96	73.02	975.31

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.16	0.94	0.64	0.31	0.04	0.00	-	-	0.00	0.20	0.51	0.94	4.75
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.15
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.17	0.96	0.65	0.33	0.05	0.01	0.01	0.01	0.02	0.21	0.52	0.95	4.90

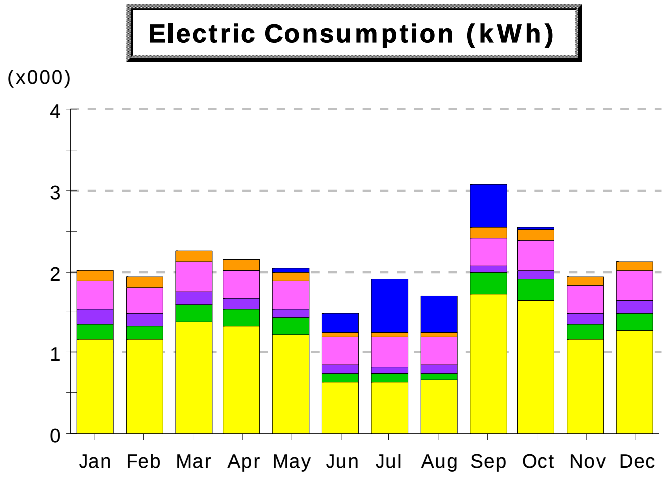


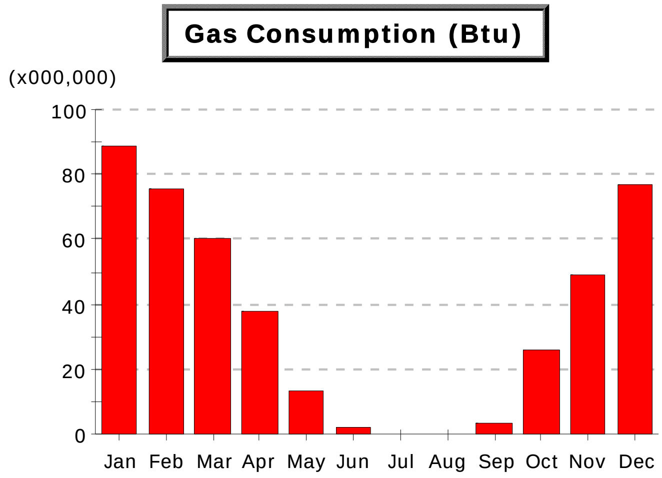
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	4.66	4.20	4.65	5.66	11.14	25.81	37.40	32.14	21.56	7.64	5.46	4.65	164.97
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.74	0.63	0.52	0.32	0.05	0.00	-	-	0.01	0.20	0.43	0.65	3.55
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	16.17	14.60	16.17	15.64	16.17	15.64	16.17	16.17	15.64	16.17	15.64	16.17	190.33
Pumps & Aux.	4.44	4.01	4.43	4.28	4.40	4.26	4.40	4.40	4.26	4.41	4.28	4.44	52.00
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	9.54	9.42	11.28	10.80	9.97	10.81	10.41	10.85	10.37	9.97	9.93	10.41	123.76
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	34.42	33.99	40.74	39.01	36.01	39.01	37.57	39.16	37.43	36.00	35.85	37.58	446.78
Total	69.95	66.84	77.80	75.72	77.74	95.53	105.94	102.72	89.27	74.39	71.59	73.89	981.38

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	857.1	691.1	446.3	207.0	21.0	0.3	-	-	2.3	132.2	355.3	676.2	3,388.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	12.9	13.1	15.7	14.7	12.7	12.6	11.2	11.2	10.7	10.8	11.6	13.1	150.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	870.0	704.2	462.0	221.8	33.6	12.8	11.2	11.2	13.0	143.0	366.9	689.3	3,539.0





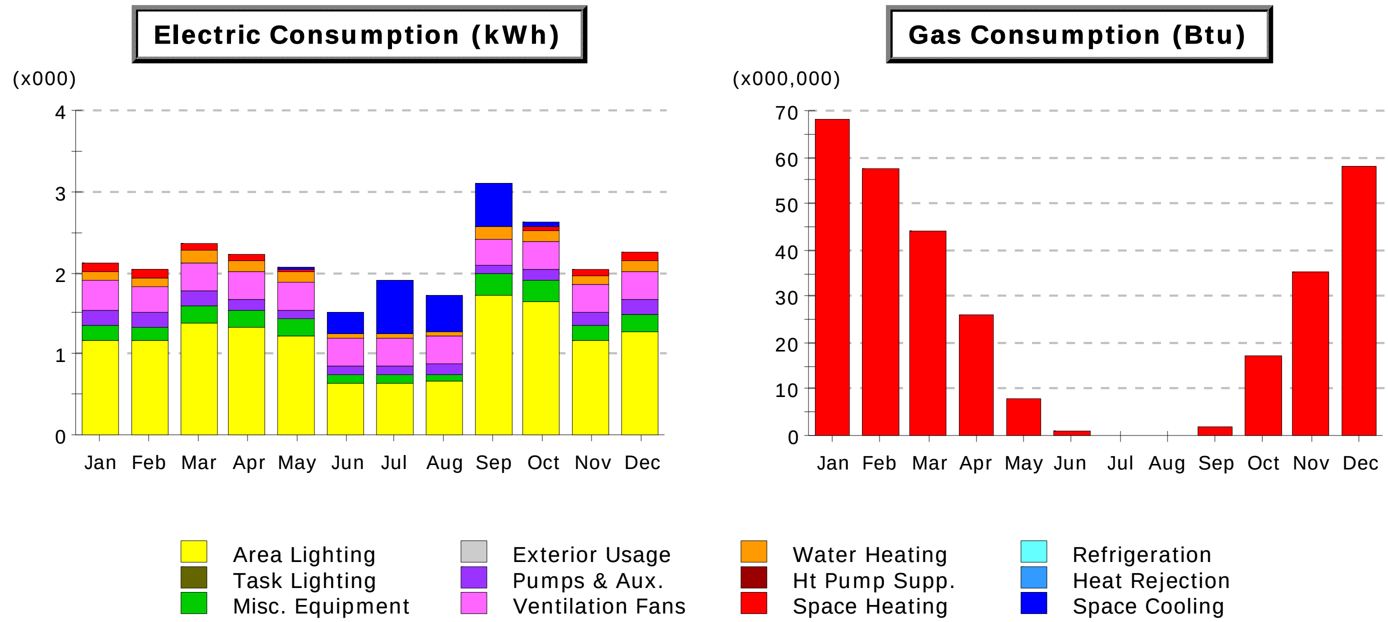
Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.00	0.04	0.26	0.67	0.44	0.53	0.04	0.00	-	1.98
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.12	0.12	0.14	0.14	0.12	0.06	0.05	0.05	0.14	0.14	0.11	0.12	1.31
Vent. Fans	0.35	0.32	0.35	0.34	0.35	0.34	0.35	0.35	0.34	0.35	0.34	0.35	4.14
Pumps & Aux.	0.17	0.16	0.16	0.13	0.11	0.10	0.10	0.10	0.10	0.12	0.14	0.17	1.56
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.18	0.18	0.21	0.20	0.19	0.10	0.10	0.10	0.26	0.25	0.18	0.20	2.17
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.18	1.16	1.38	1.32	1.23	0.65	0.63	0.65	1.71	1.65	1.17	1.28	14.01
Total	2.01	1.93	2.26	2.15	2.04	1.50	1.90	1.70	3.07	2.55	1.94	2.13	25.17

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	88.50	75.43	60.25	37.42	13.12	2.09	-	0.15	3.32	25.73	48.85	76.58	431.45
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	88.50	75.43	60.25	37.42	13.12	2.09	-	0.15	3.32	25.73	48.85	76.58	431.45

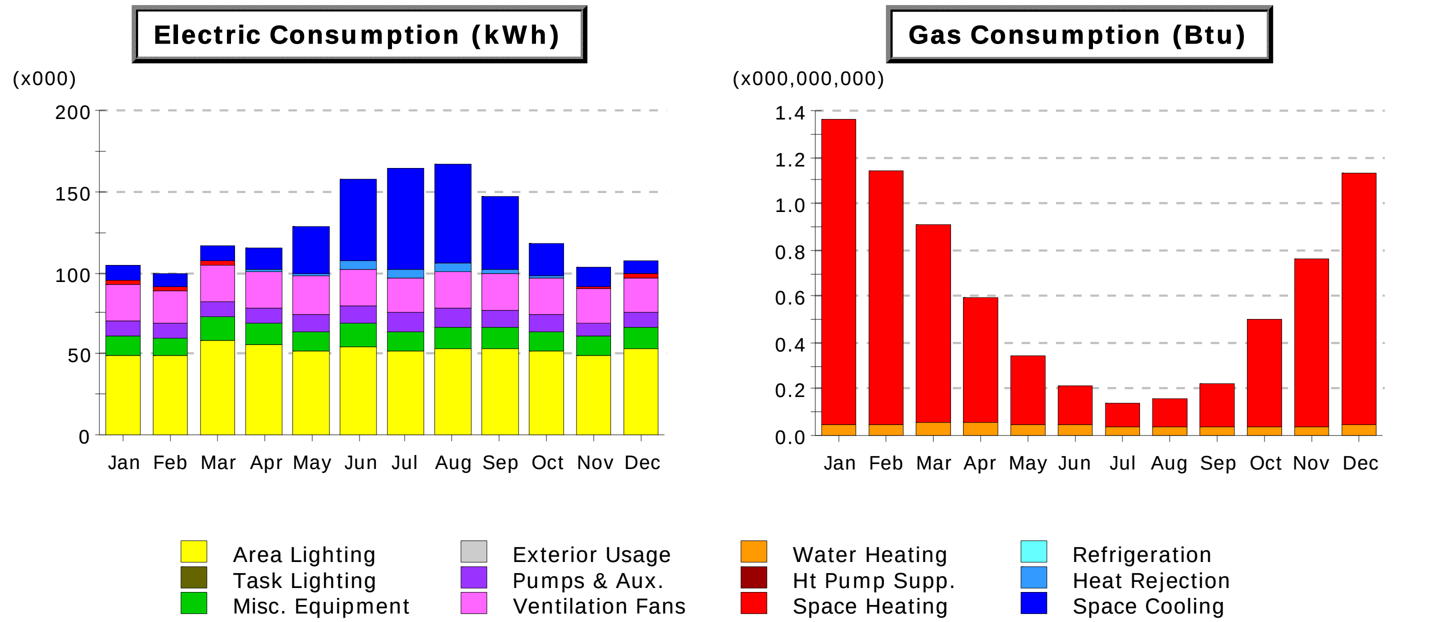


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.00	0.04	0.26	0.67	0.44	0.53	0.04	0.00	-	1.98
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.11	0.09	0.09	0.07	0.03	0.00	-	0.00	0.01	0.05	0.08	0.10	0.63
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.12	0.12	0.14	0.14	0.12	0.06	0.05	0.05	0.14	0.14	0.11	0.12	1.31
Vent. Fans	0.35	0.32	0.35	0.34	0.35	0.34	0.35	0.35	0.34	0.35	0.34	0.35	4.14
Pumps & Aux.	0.19	0.17	0.17	0.15	0.12	0.11	0.11	0.11	0.11	0.14	0.15	0.19	1.72
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.18	0.18	0.21	0.20	0.19	0.10	0.10	0.10	0.26	0.25	0.18	0.20	2.17
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.18	1.16	1.38	1.32	1.23	0.65	0.63	0.65	1.71	1.65	1.17	1.28	14.01
Total	2.13	2.04	2.36	2.23	2.08	1.51	1.92	1.71	3.09	2.61	2.04	2.24	25.96

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	67.98	57.54	44.10	25.73	7.85	1.00	-	0.05	1.72	17.01	35.22	57.75	315.95
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	67.98	57.54	44.10	25.73	7.85	1.00	-	0.05	1.72	17.01	35.22	57.75	315.95

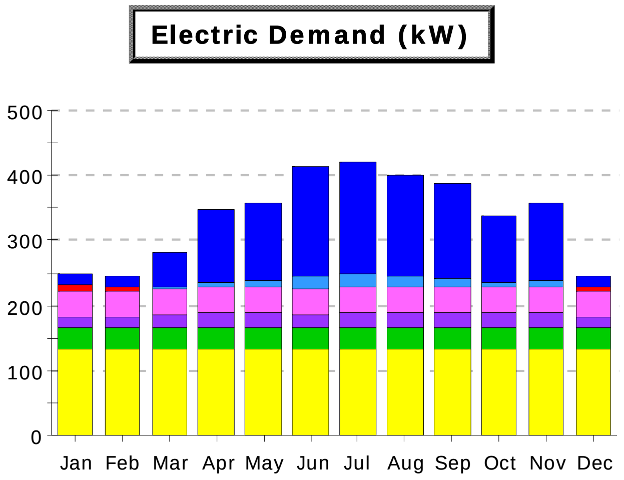


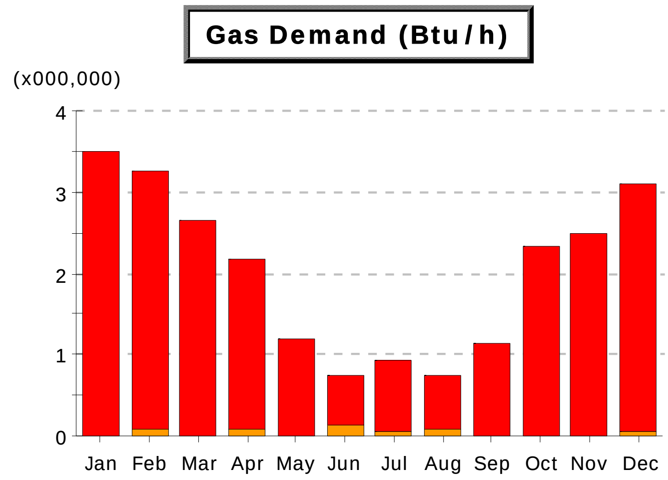
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	8.9	8.3	9.7	13.5	29.5	51.1	62.3	60.4	43.9	20.0	11.7	8.6	328.0
Heat Reject.	-	-	0.0	0.3	1.7	4.2	5.7	5.4	3.5	1.0	0.3	-	22.2
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	3.1	2.6	1.7	0.8	0.1	0.0	-	-	0.0	0.5	1.2	2.3	12.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	22.3	20.6	23.5	22.2	22.9	22.4	21.3	22.5	22.0	22.9	21.0	21.7	265.3
Pumps & Aux.	9.0	8.3	9.4	9.3	10.9	11.8	11.4	12.1	11.2	10.1	8.6	8.7	120.9
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.9	11.7	14.1	13.5	12.4	13.3	12.4	13.0	12.8	12.4	11.8	13.0	152.2
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	49.0	48.4	58.2	55.5	51.3	54.9	51.1	53.4	52.9	51.2	48.7	53.5	628.3
Total	104.2	100.0	116.7	115.1	128.9	157.7	164.3	166.8	146.4	118.2	103.3	107.9	1,529.3

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.31	1.10	0.85	0.54	0.30	0.16	0.10	0.12	0.18	0.46	0.72	1.08	6.92
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.05	0.05	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.56
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.36	1.15	0.91	0.59	0.35	0.21	0.14	0.16	0.22	0.50	0.76	1.13	7.48



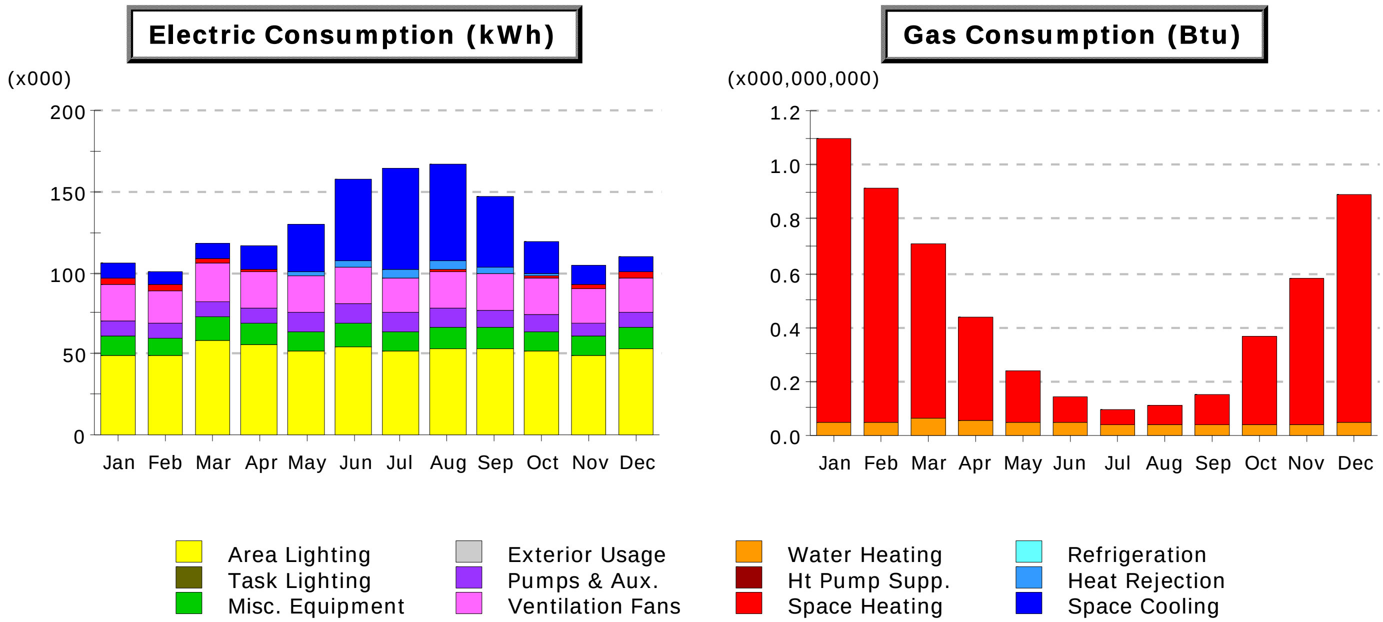


Electric Demand (kW)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	16.1	16.1	53.6	111.1	118.7	170.1	173.0	156.9	145.0	103.2	118.2	16.1	1,198.1
Heat Reject.	-	-	1.8	8.9	11.1	17.6	19.9	17.4	14.9	7.9	11.7	-	111.3
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.9	8.3	0.4	-	-	-	-	-	-	-	-	7.8	26.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	39.8	39.8	39.8	39.8	39.8	39.9	39.9	39.9	39.9	39.8	39.8	39.8	478.1
Pumps & Aux.	16.0	16.0	21.0	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	16.0	245.7
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	32.2	32.2	32.2	32.2	32.2	32.0	32.2	32.2	32.2	32.2	32.2	32.2	386.5
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	133.2	133.2	133.2	133.2	133.2	132.5	133.2	133.2	133.2	133.2	133.2	133.2	1,598.2
Total	247.2	245.6	282.1	347.4	357.2	414.3	420.4	401.8	387.4	338.5	357.3	245.1	4,044.3

Gas Demand (Btu/h x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	3.49	3.18	2.64	2.12	1.18	0.63	0.87	0.66	1.13	2.33	2.48	3.02	23.72
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.01	0.07	0.01	0.07	0.00	0.12	0.05	0.08	0.00	0.00	0.00	0.06	0.48
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3.49	3.25	2.64	2.18	1.18	0.75	0.92	0.74	1.14	2.33	2.48	3.09	24.20

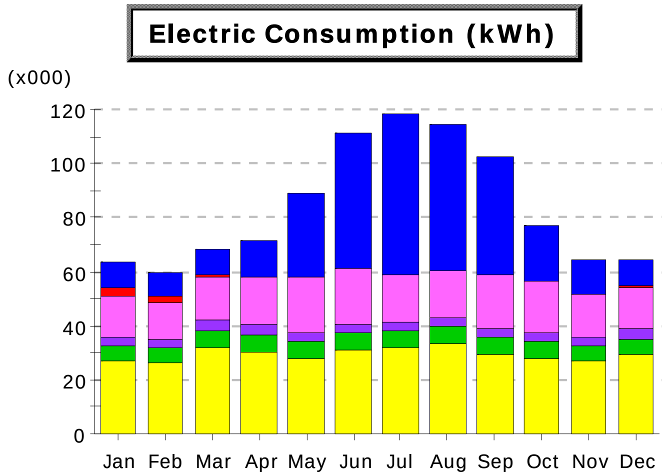


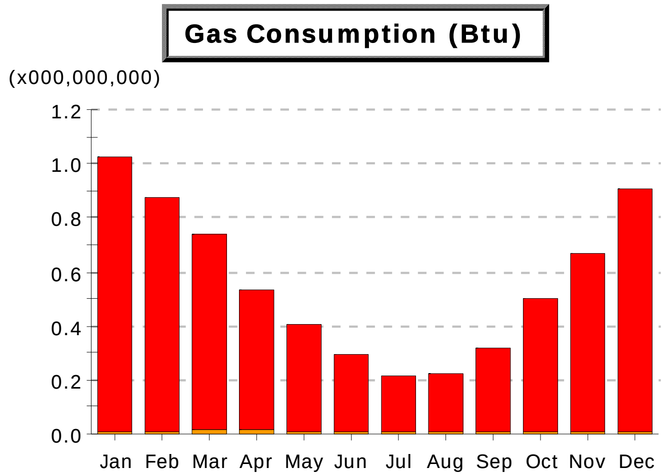
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	8.9	8.3	9.7	13.5	29.5	51.1	62.3	60.4	43.9	20.0	11.7	8.6	328.0
Heat Reject.	-	-	0.0	0.3	1.7	4.2	5.7	5.4	3.5	1.0	0.3	-	22.2
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	4.4	3.7	2.9	1.7	0.7	0.3	0.2	0.2	0.4	1.2	2.2	3.5	21.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	22.3	20.6	23.5	22.2	22.9	22.4	21.3	22.5	22.0	22.9	21.0	21.7	265.3
Pumps & Aux.	9.2	8.5	9.7	9.5	11.1	12.0	11.6	12.3	11.4	10.3	8.8	8.9	123.4
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.9	11.7	14.1	13.5	12.4	13.3	12.4	13.0	12.8	12.4	11.8	13.0	152.2
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	49.0	48.4	58.2	55.5	51.3	54.9	51.1	53.4	52.9	51.2	48.7	53.5	628.3
Total	105.7	101.3	118.0	116.2	129.7	158.3	164.7	167.3	147.0	119.1	104.5	109.3	1,540.9

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.05	0.87	0.65	0.39	0.19	0.09	0.05	0.07	0.11	0.32	0.54	0.84	5.16
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.05	0.05	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.56
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.09	0.92	0.71	0.44	0.24	0.14	0.10	0.11	0.15	0.36	0.58	0.89	5.72



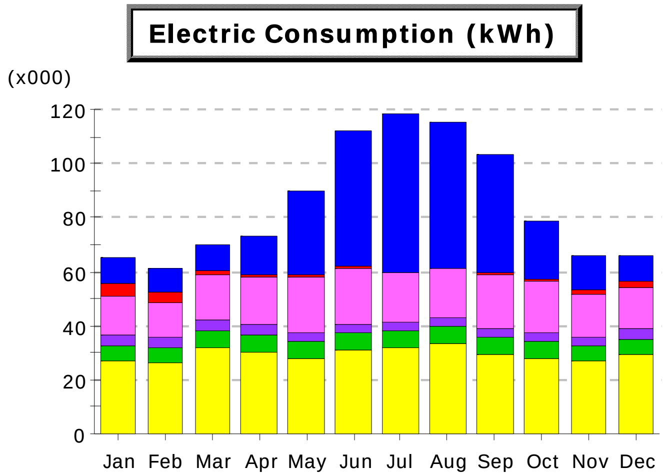


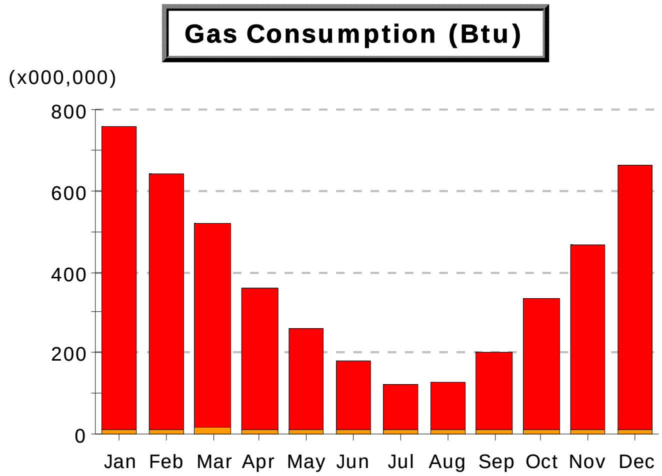
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	9.4	8.5	9.6	13.6	31.1	50.3	59.1	53.8	44.0	20.8	12.5	9.4	322.1
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	3.3	2.2	0.3	0.0	0.0	-	-	-	-	0.0	0.2	1.0	7.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	14.9	13.5	16.5	17.8	20.5	20.3	18.1	18.0	19.8	18.9	16.0	14.9	209.3
Pumps & Aux.	3.7	3.4	3.7	3.5	3.6	3.3	2.8	2.8	3.3	3.6	3.6	3.7	41.0
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	5.6	5.5	6.6	6.3	5.9	6.5	6.6	6.9	6.2	5.9	5.6	6.1	73.7
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.8	26.4	31.6	30.3	28.0	31.0	31.6	33.0	29.5	28.0	26.7	29.2	352.0
Total	63.7	59.5	68.3	71.6	89.1	111.3	118.3	114.6	102.8	77.2	64.5	64.3	1,005.3

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.01	0.86	0.72	0.52	0.39	0.28	0.20	0.21	0.31	0.49	0.66	0.90	6.56
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.13
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.02	0.87	0.74	0.54	0.40	0.29	0.21	0.22	0.32	0.50	0.67	0.91	6.69



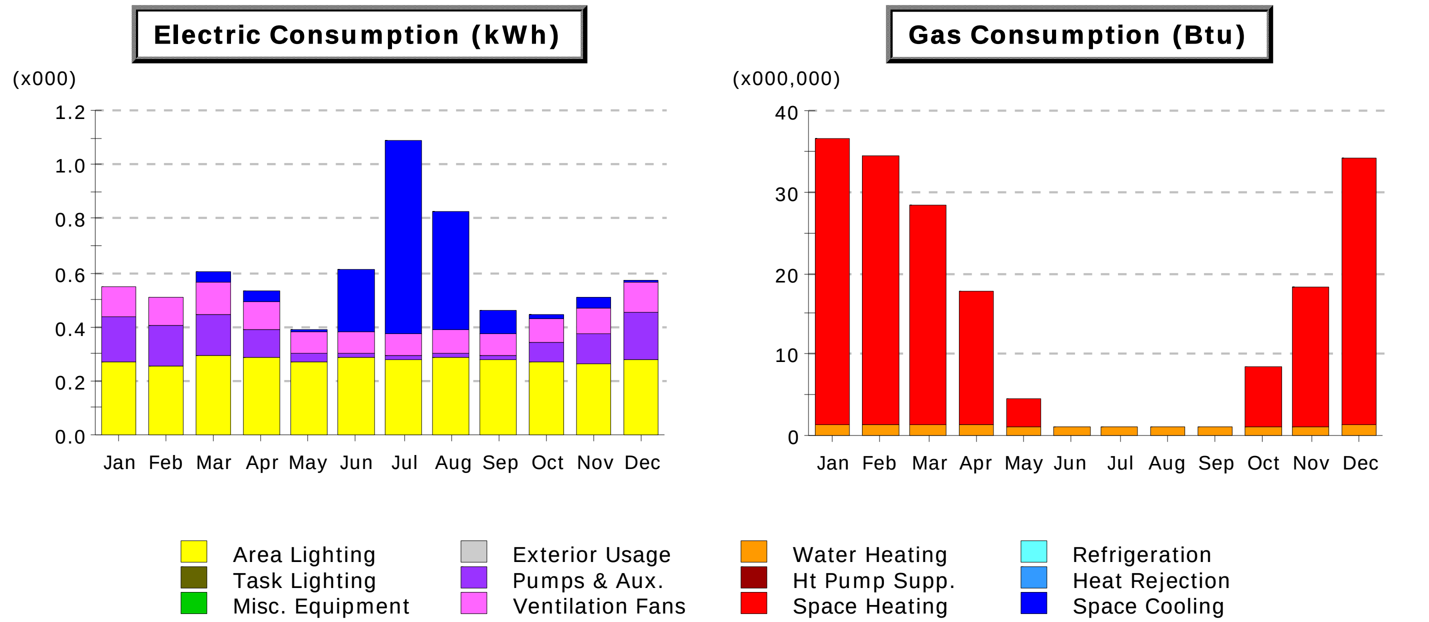


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	9.4	8.5	9.6	13.6	31.1	50.3	59.1	53.8	44.0	20.8	12.5	9.4	322.1
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	4.7	3.5	1.6	1.1	0.8	0.6	0.4	0.4	0.6	1.0	1.4	2.4	18.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	14.9	13.5	16.5	17.8	20.5	20.3	18.1	18.0	19.8	18.9	16.0	14.9	209.3
Pumps & Aux.	3.8	3.5	3.8	3.6	3.7	3.3	2.9	2.9	3.4	3.7	3.6	3.8	42.0
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	5.6	5.5	6.6	6.3	5.9	6.5	6.6	6.9	6.2	5.9	5.6	6.1	73.7
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.8	26.4	31.6	30.3	28.0	31.0	31.6	33.0	29.5	28.0	26.7	29.2	352.0
Total	65.2	60.8	69.7	72.7	90.0	111.9	118.8	115.1	103.5	78.3	65.8	65.8	1,017.7

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	745.2	628.7	508.0	349.4	248.6	169.7	111.6	118.7	191.9	325.9	457.0	650.5	4,505.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.1	11.4	13.8	13.0	11.1	11.4	10.9	10.8	9.4	9.3	9.5	11.4	133.0
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	756.3	640.1	521.7	362.4	259.7	181.0	122.4	129.4	201.3	335.2	466.6	661.8	4,638.1

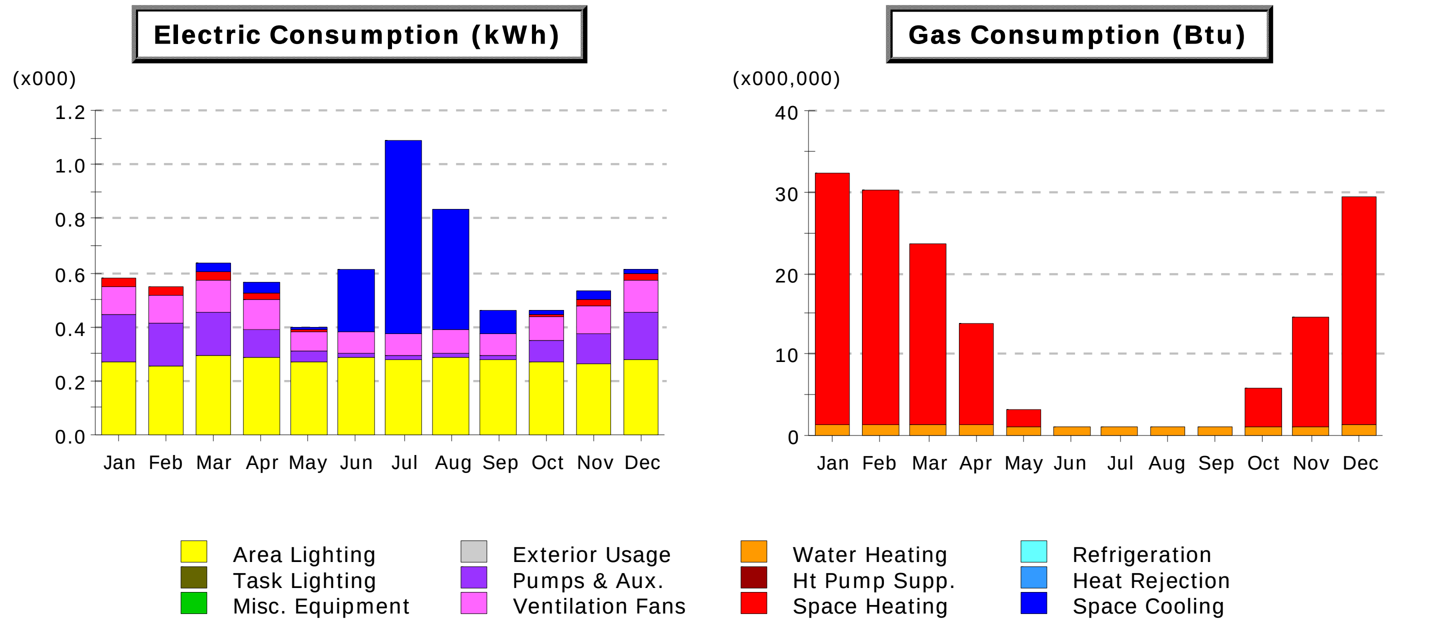


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.00	-	0.04	0.04	0.01	0.23	0.71	0.44	0.08	0.02	0.04	0.01	1.62
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.12	0.11	0.08	0.08	0.08	0.08	0.08	0.09	0.10	0.11	1.14
Pumps & Aux.	0.17	0.15	0.15	0.10	0.03	0.02	0.02	0.02	0.02	0.07	0.11	0.17	1.03
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.27	0.25	0.30	0.28	0.27	0.28	0.28	0.29	0.28	0.27	0.26	0.28	3.32
Total	0.55	0.51	0.60	0.54	0.39	0.61	1.09	0.83	0.46	0.45	0.51	0.57	7.10

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	35.36	33.19	26.83	16.54	3.36	-	-	-	-	7.49	17.10	32.87	172.73
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.27	1.25	1.43	1.33	1.17	1.11	1.01	0.99	0.96	1.02	1.07	1.26	13.88
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	36.63	34.44	28.26	17.88	4.53	1.11	1.01	0.99	0.96	8.50	18.17	34.13	186.61

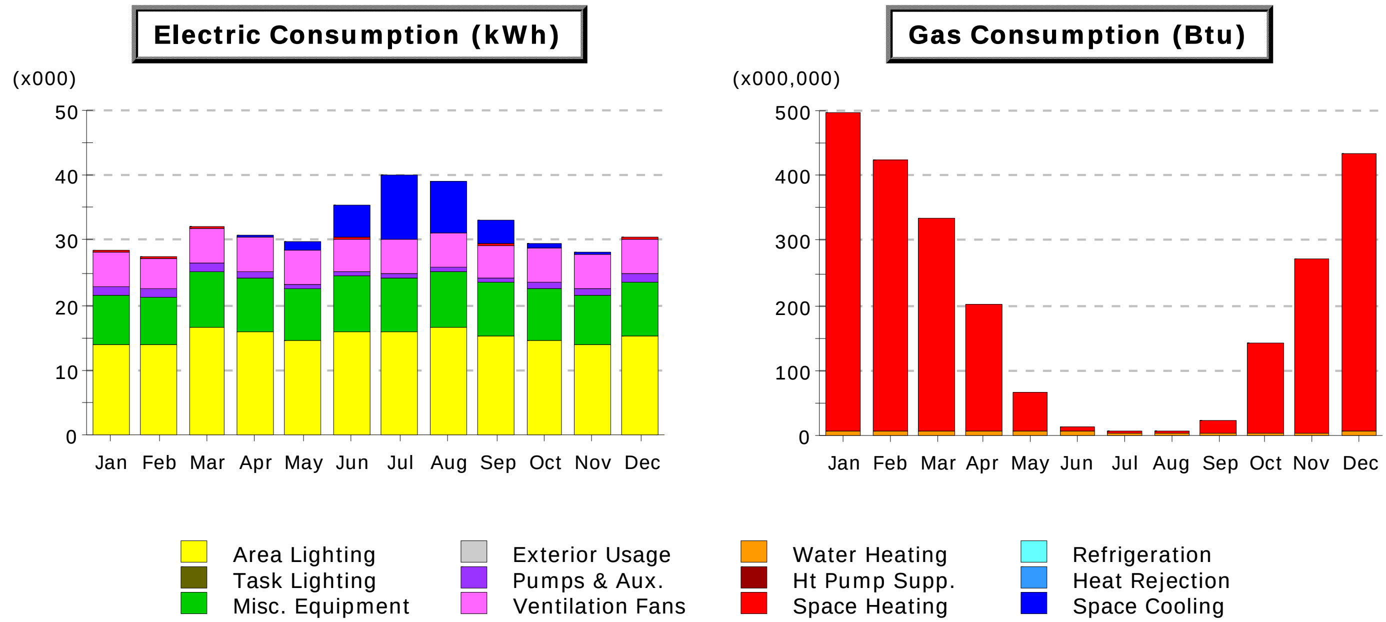


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.00	-	0.04	0.04	0.01	0.23	0.71	0.44	0.08	0.02	0.04	0.01	1.62
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.03	0.03	0.03	0.02	0.01	-	-	-	-	0.01	0.02	0.03	0.18
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.12	0.11	0.08	0.08	0.08	0.08	0.08	0.09	0.10	0.11	1.14
Pumps & Aux.	0.18	0.16	0.16	0.11	0.03	0.02	0.02	0.02	0.02	0.07	0.11	0.18	1.07
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.27	0.25	0.30	0.28	0.27	0.28	0.28	0.29	0.28	0.27	0.26	0.28	3.32
Total	0.58	0.54	0.64	0.57	0.40	0.61	1.09	0.83	0.46	0.46	0.54	0.61	7.33

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	31.06	28.89	22.01	12.51	1.91	-	-	-	-	4.91	13.55	28.22	143.08
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.27	1.25	1.43	1.33	1.17	1.11	1.01	0.99	0.96	1.02	1.07	1.26	13.88
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	32.34	30.14	23.44	13.84	3.08	1.11	1.01	0.99	0.96	5.93	14.62	29.48	156.96

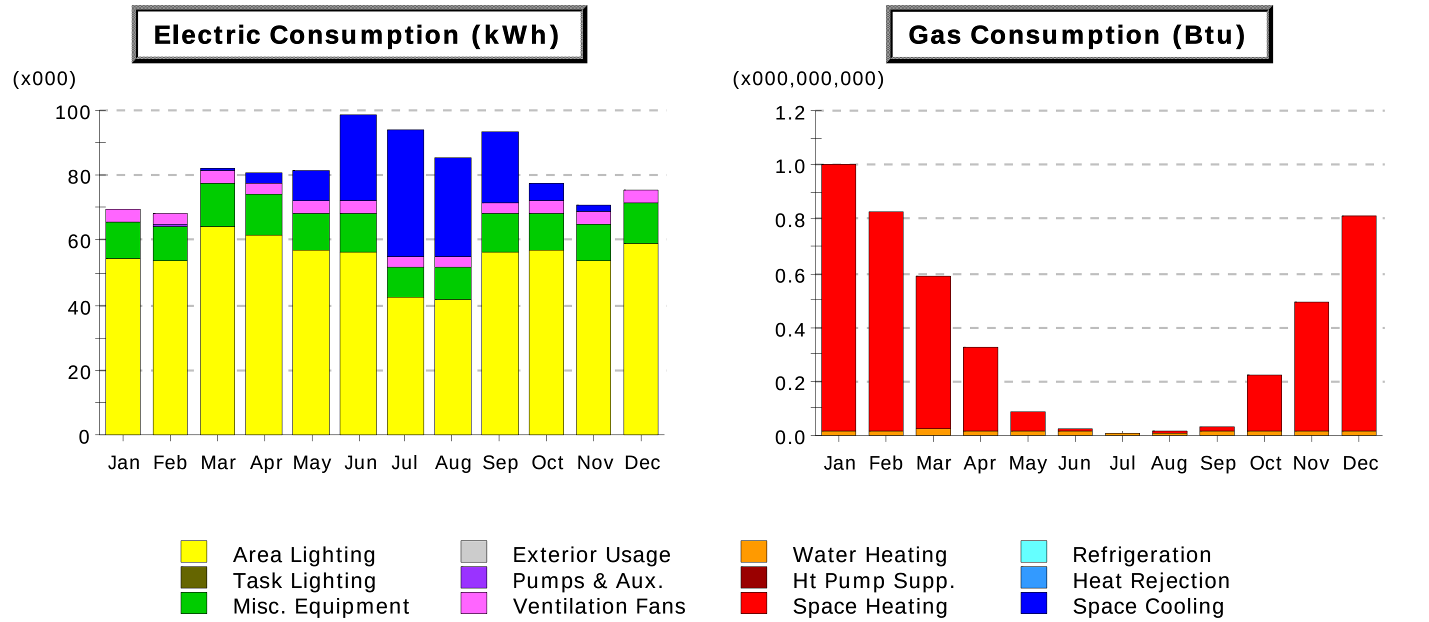


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.01	0.01	0.00	0.20	1.12	5.17	9.84	7.83	3.72	0.52	0.18	0.00	28.61
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.29	0.24	0.19	0.13	0.05	0.01	0.00	0.00	0.02	0.09	0.16	0.24	1.43
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.35	4.84	5.36	5.19	5.35	5.15	5.31	5.31	5.17	5.37	5.19	5.35	62.95
Pumps & Aux.	1.36	1.22	1.24	1.00	0.72	0.64	0.66	0.66	0.64	0.89	1.05	1.34	11.41
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.56	7.44	8.88	8.51	7.89	8.60	8.52	8.86	8.24	7.89	7.52	8.22	98.15
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	13.99	13.76	16.44	15.75	14.61	15.91	15.77	16.41	15.25	14.61	13.92	15.22	181.63
Total	28.56	27.50	32.12	30.78	29.74	35.48	40.10	39.08	33.04	29.36	28.02	30.38	384.17

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	493.0	417.6	327.7	196.2	61.1	9.5	0.3	1.6	19.1	139.3	268.6	427.8	2,361.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.2	5.3	6.3	5.9	5.1	5.1	4.7	4.7	4.4	4.4	4.5	5.3	60.8
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	498.2	422.9	334.0	202.1	66.2	14.5	5.0	6.2	23.4	143.7	273.1	433.1	2,422.5



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.00	0.00	0.53	3.00	9.39	26.96	38.85	30.67	21.79	5.53	2.13	0.08	138.93
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	3.84	3.47	3.84	3.73	3.88	3.69	3.26	3.19	3.65	3.86	3.72	3.84	43.96
Pumps & Aux.	0.33	0.30	0.27	0.17	0.03	0.00	-	-	0.00	0.11	0.20	0.32	1.73
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.07	10.93	13.09	12.54	11.58	11.78	9.43	9.81	11.53	11.58	11.02	12.08	136.45
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	54.19	53.50	64.09	61.38	56.67	56.41	42.36	41.81	56.40	56.67	53.96	59.14	656.56
Total	69.45	68.19	81.82	80.81	81.54	98.84	93.91	85.48	93.37	77.74	71.03	75.46	977.64

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.98	0.81	0.57	0.31	0.07	0.01	0.00	0.00	0.02	0.21	0.48	0.79	4.24
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.19
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.00	0.82	0.59	0.32	0.09	0.02	0.01	0.01	0.03	0.23	0.49	0.81	4.43

APPENDIX D

LIGHTING SPREADSHEETS

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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)	Occupany Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Beach Administration Building - Exterior Lighting	000	Exterior	60W Incandescent Fixture	10	600	0.6	5110	3066	$459.9	Replace 60W Incandescent Fixture with 13W CFL	10	130	0.13	5110	5110	664.3	664.3	None Proposed	0	0.47	2401.7	360.3	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$200.0	$50.0	$250.0
Beach Administration Building - Exterior Lighting	000	Exterior	Exterior Wall Packs (Assume 70w)	2	180	0.18	5110	919.8	$138.0	Replace 70W Fixture with Induction Light Fixture	2	88	0.088	5110	5110	449.68	449.68	None Proposed	0	0.092	470.12	70.5	$0.0	$380.0	$137.0	$0.0	$0.0	$137.0	$380.0	$517.0	$274.0	$760.0	$1,034.0
Beach Administration Building - Exterior Lighting	000	Exterior	13W CFL Fixture	1	13	0.013	5110	66.43	$10.0	None Proposed	1	13	0.013	5110	5110	66.43	66.43	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Conference Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	1216.8	1.2168	3285	3997.188	$599.6	None Proposed	24	1216.8	1.2168	3285	3285	3997.188	3997.188	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Copy Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$99.9	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Electrical Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	4015	610.6815	$91.6	None Proposed	3	152.1	0.1521	4015	4015	610.6815	610.6815	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	4015	814.242	$122.1	None Proposed	4	202.8	0.2028	4015	4015	814.242	814.242	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	4015	407.121	$61.1	None Proposed	2	101.4	0.1014	4015	4015	407.121	407.121	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Janitor's Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Beach Administration Building - Interior Lighting	001	Main Office Space	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	19	2128	2.128	3285	6990.48	$1,048.6	None Proposed	19	2128	2.128	3285	3285	6990.48	6990.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Men's Bathroom	1x4 Fixtures w/ 1-T12 Lamp Fixture w/ Magnetic Ballast	1	42.8	0.0428	500	21.4	$3.2	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	24.32	0.02432	500	350	12.16	8.512	Ceiling Mounted Occupancy Sensor	1	0.01848	12.888	1.9	$35.0	$5.0	$65.0	$103.0	$73.5	$65.0	$40.0	$105.0	$138.5	$143.0	$281.5
Beach Administration Building - Interior Lighting	001	Men's Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Beach Administration Building - Interior Lighting	001	Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3285	735.84	$110.4	None Proposed	2	224	0.224	3285	3285	735.84	735.84	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3285	735.84	$110.4	None Proposed	2	224	0.224	3285	3285	735.84	735.84	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Offices	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3285	735.84	$110.4	None Proposed	2	224	0.224	3285	3285	735.84	735.84	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Offices	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$149.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Offices	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3285	2207.52	$331.1	None Proposed	6	672	0.672	3285	3285	2207.52	2207.52	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Server Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3285	735.84	$110.4	None Proposed	2	224	0.224	3285	3285	735.84	735.84	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Beach Administration Building - Interior Lighting	001	Utility Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Exterior Lighting	000	Exterior	Exterior Wall Packs (Assume 70w)	5	450	0.45	5110	2299.5	$344.9	Replace 70W Fixture with Induction Light Fixture	5	220	0.22	5110	5110	1124.2	1124.2	None Proposed	0	0.23	1175.3	176.3	$0.0	$380.0	$137.0	$0.0	$0.0	$137.0	$380.0	$517.0	$685.0	$1,900.0	$2,585.0
Dorothy Bullock School - Exterior Lighting	000	Exterior	Exterior Wall Packs (Assume 70w)	5	450	0.45	3285	1478.25	$221.7	Replace 70W Fixture with Induction Light Fixture	5	220	0.22	3285	3285	722.7	722.7	None Proposed	0	0.23	755.55	113.3	$0.0	$380.0	$137.0	$0.0	$0.0	$137.0	$380.0	$517.0	$685.0	$1,900.0	$2,585.0
Dorothy Bullock School - Exterior Lighting	000	Exterior	Exterior Wall Packs (Assume 70w)	20	1800	1.8	5110	9198	$1,379.7	Replace 70W Fixture with Induction Light Fixture	20	880	0.88	5110	5110	4496.8	4496.8	None Proposed	0	0.92	4701.2	705.2	$0.0	$380.0	$137.0	$0.0	$0.0	$137.0	$380.0	$517.0	$2,740.0	$7,600.0	$10,340.0
Dorothy Bullock School - Interior Lighting	001	A-10	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-11	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-12	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-13	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-15	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-2	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-20	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-21	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-3	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-4	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-5	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-6	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-7	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-8	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	A-9	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Administration	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	704	0.704	3285	2312.64	$346.9	None Proposed	8	704	0.704	3285	3285	2312.64	2312.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Administration	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$149.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Administration	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$173.4	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Administration	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	704	0.704	3285	2312.64	$346.9	None Proposed	8	704	0.704	3285	3285	2312.64	2312.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Art Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	26	1318.2	1.3182	3285	4330.287	$649.5	None Proposed	26	1318.2	1.3182	3285	3285	4330.287	4330.287	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Art Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-11	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$86.7	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-11	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-35	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-36	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-43	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-44	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-7	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$86.7	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-8	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	22	1115.4	1.1154	3285	3664.089	$549.6	None Proposed	22	1115.4	1.1154	3285	3285	3664.089	3664.089	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-8	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	B-8	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$86.7	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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)	Occupany Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Dorothy Bullock School - Interior Lighting	001	Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	3285	2498.2425	$374.7	None Proposed	15	760.5	0.7605	3285	3285	2498.2425	2498.2425	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Break Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$99.9	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-24	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-25	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-33	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-33	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-33	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-37	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$260.2	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-38	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-39	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-40	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-41	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-6	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$173.4	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-7	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$173.4	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	C-9	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$173.4	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Cafeteria	400W Metal Halide Fixtures	16	7328	7.328	3285	24072.48	$3,610.9	Replace Metal Halide Fixtures with 6-Lamp Fluorescent Highbay Fixtures	16	3616	3.616	3285	3285	11878.56	11878.56	None Proposed	0	3.712	12193.92	1,829.1	$168.0	$105.0	$100.0	$0.0	$0.0	$100.0	$273.0	$373.0	$1,600.0	$4,368.0	$5,968.0
Dorothy Bullock School - Interior Lighting	001	Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Closet	13W CFL Fixture	1	13	0.013	500	6.5	$1.0	None Proposed	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0	1.95	0.3	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	$7.6	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.3	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Conference Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3285	1665.495	$249.8	None Proposed	10	507	0.507	3285	3285	1665.495	1665.495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Conference Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	704	0.704	3285	2312.64	$346.9	None Proposed	8	704	0.704	3285	3285	2312.64	2312.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Counseling	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$260.2	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-11	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-11	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-13	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-13	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-15	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-17	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-17	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-19	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-19	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-2	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-2	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-2	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-21	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-21	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-23	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-23	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-25	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-25	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-25	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-5	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-5	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-7	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-7	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-9	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$477.0	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	D-9	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Demonstration	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Electrical Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	$15.2	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Faculty Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	500	396	$59.4	None Proposed	9	792	0.792	500	350	396	277.2	Ceiling Mounted Occupancy Sensor	1	0	118.8	17.8	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Faculty Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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)	Occupany Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Dorothy Bullock School - Interior Lighting	001	Gym	400W Metal Halide Fixtures	20	9160	9.16	3285	30090.6	$4,513.6	Replace Metal Halide Fixtures with 6-Lamp Fluorescent Highbay Fixtures	20	4520	4.52	3285	3285	14848.2	14848.2	None Proposed	0	4.64	15242.4	2,286.4	$168.0	$105.0	$100.0	$0.0	$0.0	$100.0	$273.0	$373.0	$2,000.0	$5,460.0	$7,460.0
Dorothy Bullock School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	33	1673.1	1.6731	4015	6717.4965	$1,007.6	None Proposed	33	1673.1	1.6731	4015	4015	6717.4965	6717.4965	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	4015	1221.363	$183.2	None Proposed	6	304.2	0.3042	4015	4015	1221.363	1221.363	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	4015	610.6815	$91.6	None Proposed	3	152.1	0.1521	4015	4015	610.6815	610.6815	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	811.2	0.8112	4015	3256.968	$488.5	None Proposed	16	811.2	0.8112	4015	4015	3256.968	3256.968	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	4015	2442.726	$366.4	None Proposed	12	608.4	0.6084	4015	4015	2442.726	2442.726	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	4015	2035.605	$305.3	None Proposed	10	507	0.507	4015	4015	2035.605	2035.605	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	4015	1628.484	$244.3	None Proposed	8	405.6	0.4056	4015	4015	1628.484	1628.484	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	13	659.1	0.6591	4015	2646.2865	$396.9	None Proposed	13	659.1	0.6591	4015	4015	2646.2865	2646.2865	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Hallway	13W CFL Fixture	10	130	0.13	4015	521.95	$78.3	None Proposed	10	130	0.13	4015	4015	521.95	521.95	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Hallway	13W CFL Fixture	8	104	0.104	4015	417.56	$62.6	None Proposed	8	104	0.104	4015	4015	417.56	417.56	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	3285	1332.396	$199.9	None Proposed	8	405.6	0.4056	3285	3285	1332.396	1332.396	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	1014	1.014	3285	3330.99	$499.6	None Proposed	20	1014	1.014	3285	3285	3330.99	3330.99	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Kitchen	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	354.9	0.3549	3285	1165.8465	$174.9	None Proposed	7	354.9	0.3549	3285	3285	1165.8465	1165.8465	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Locker Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Media Center	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$99.9	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Media Center	42W CFL Fixture	6	294	0.294	3285	965.79	$144.9	None Proposed	6	294	0.294	3285	3285	965.79	965.79	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Media Center	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	98	4968.6	4.9686	3285	16321.851	$2,448.3	None Proposed	98	4968.6	4.9686	3285	3285	16321.851	16321.851	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Media Center	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$99.9	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	500	132	$19.8	None Proposed	3	264	0.264	500	350	132	92.4	Ceiling Mounted Occupancy Sensor	1	0	39.6	5.9	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Men's Bathroom	13W CFL Fixture	2	26	0.026	500	13	$2.0	None Proposed	2	26	0.026	500	350	13	9.1	Ceiling Mounted Occupancy Sensor	1	0	3.9	0.6	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	500	88	$13.2	None Proposed	2	176	0.176	500	350	88	61.6	Ceiling Mounted Occupancy Sensor	1	0	26.4	4.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Men's Bathroom	13W CFL Fixture	2	26	0.026	500	13	$2.0	None Proposed	2	26	0.026	500	350	13	9.1	Ceiling Mounted Occupancy Sensor	1	0	3.9	0.6	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	500	132	$19.8	None Proposed	3	264	0.264	500	350	132	92.4	Ceiling Mounted Occupancy Sensor	1	0	39.6	5.9	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Men's Bathroom	42W CFL Fixture	2	98	0.098	500	49	$7.4	None Proposed	2	98	0.098	500	350	49	34.3	Ceiling Mounted Occupancy Sensor	1	0	14.7	2.2	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Nurse	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	10	880	0.88	3285	2890.8	$433.6	None Proposed	10	880	0.88	3285	3285	2890.8	2890.8	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Occupational Therapy	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$520.3	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$86.7	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Phyisical Education	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$86.7	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Phyisical Education	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	SGI	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$260.2	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	SGI	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$260.2	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	SGI	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$260.2	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Speech	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$260.2	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Staff Dining	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	10	880	0.88	3285	2890.8	$433.6	None Proposed	10	880	0.88	3285	3285	2890.8	2890.8	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Staff Dining	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Stage	400W Metal Halide Fixtures	4	1832	1.832	3285	6018.12	$902.7	Replace Metal Halide Fixtures with 6-Lamp Fluorescent Highbay Fixtures	4	904	0.904	3285	3285	2969.64	2969.64	None Proposed	0	0.928	3048.48	457.3	$168.0	$105.0	$100.0	$0.0	$0.0	$100.0	$273.0	$373.0	$400.0	$1,092.0	$1,492.0
Dorothy Bullock School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	500	152.1	$22.8	None Proposed	6	304.2	0.3042	500	500	152.1	152.1	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	500	202.8	$30.4	None Proposed	8	405.6	0.4056	500	500	202.8	202.8	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Walk Thru	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Walkway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3285	1665.495	$249.8	None Proposed	10	507	0.507	3285	3285	1665.495	1665.495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Dorothy Bullock School - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	3285	867.24	$130.1	None Proposed	3	264	0.264	3285	2299.5	867.24	607.068	Ceiling Mounted Occupancy Sensor	1	0	260.172	39.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Women's Bathroom	13W CFL Fixture	2	26	0.026	3285	85.41	$12.8	None Proposed	2	26	0.026	3285	2299.5	85.41	59.787	Ceiling Mounted Occupancy Sensor	1	0	25.623	3.8	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$86.7	None Proposed	2	176	0.176	3285	2299.5	578.16	404.712	Ceiling Mounted Occupancy Sensor	1	0	173.448	26.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Women's Bathroom	13W CFL Fixture	2	26	0.026	3285	85.41	$12.8	None Proposed	2	26	0.026	3285	2299.5	85.41	59.787	Ceiling Mounted Occupancy Sensor	1	0	25.623	3.8	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	3285	867.24	$130.1	None Proposed	3	264	0.264	3285	2299.5	867.24	607.068	Ceiling Mounted Occupancy Sensor	1	0	260.172	39.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Dorothy Bullock School - Interior Lighting	001	Women's Bathroom	42W CFL Fixture	2	98	0.098	3285	321.93	$48.3	None Proposed	2	98	0.098	3285	2299.5	321.93	225.351	Ceiling Mounted Occupancy Sensor	1	0	96.579	14.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Elsmere School - Exterior Lighting	000	Exterior	Exterior Wall Packs (Assume 70w)	8	720	0.72	5110	3679.2	$588.7	Replace 70W Fixture with Induction Light Fixture	8	352	0.352	5110	5110	1798.72	1798.72	None Proposed	0	0.368	1880.48	300.9	$0.0	$380.0	$137.0	$0.0	$0.0	$137.0	$380.0	$517.0	$1,096.0	$3,040.0	$4,136.0
Elsmere School - Interior Lighting	001	1	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$555.0	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Elsmere School - Interior Lighting	001	2	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$555.0	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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)	Occupany Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Elsmere School - Interior Lighting	001	3	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$555.0	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Elsmere School - Interior Lighting	001	4	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$555.0	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Elsmere School - Interior Lighting	001	Boiler Room	60W Incandescent Fixture	2	120	0.12	3285	394.2	$63.1	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	3285	3285	85.41	85.41	None Proposed	0	0.094	308.79	49.4	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$40.0	$10.0	$50.0
Elsmere School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	354.9	0.3549	4015	1424.9235	$228.0	None Proposed	7	354.9	0.3549	4015	4015	1424.9235	1424.9235	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Elsmere School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	4015	203.5605	$32.6	None Proposed	1	50.7	0.0507	4015	4015	203.5605	203.5605	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Elsmere School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	500	88	$14.1	None Proposed	2	176	0.176	500	350	88	61.6	Ceiling Mounted Occupancy Sensor	1	0	26.4	4.2	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Elsmere School - Interior Lighting	001	Men's Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$4.1	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.2	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Elsmere School - Interior Lighting	001	Offices	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$159.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Elsmere School - Interior Lighting	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	$16.2	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Elsmere School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	$16.2	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Elsmere School - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$92.5	None Proposed	2	176	0.176	3285	2299.5	578.16	404.712	Ceiling Mounted Occupancy Sensor	1	0	173.448	27.8	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Elsmere School - Interior Lighting	001	Women's Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$26.6	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	8.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Exterior Lighting	000	Exterior	Exterior Wall Packs (Assume 70w)	26	2340	2.34	5110	11957.4	$1,554.5	Replace 70W Fixture with Induction Light Fixture	26	1144	1.144	5110	5110	5845.84	5845.84	None Proposed	0	1.196	6111.56	794.5	$0.0	$380.0	$137.0	$0.0	$0.0	$137.0	$380.0	$517.0	$3,562.0	$9,880.0	$13,442.0
Glassboro High School - Exterior Lighting	000	Exterior	42W CFL Fixture	28	1372	1.372	5110	7010.92	$911.4	None Proposed	28	1372	1.372	5110	5110	7010.92	7010.92	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Exterior Lighting	000	Exterior	Flood Lights (Assume 400W MH)	9	4122	4.122	5110	21063.42	$2,738.2	Replace 400W Fixture with Induction Light Fixture	9	1935	1.935	5110	5110	9887.85	9887.85	None Proposed	0	2.187	11175.57	1,452.8	$0.0	$485.0	$137.0	$0.0	$0.0	$137.0	$485.0	$622.0	$1,233.0	$4,365.0	$5,598.0
Glassboro High School - Exterior Lighting	000	Exterior	Pole Mounted Luminare - 1 Head (Assume 400W MH)	6	2748	2.748	5110	14042.28	$1,825.5	Replace 400W Fixture with Induction Light Fixture	6	1290	1.29	5110	5110	6591.9	6591.9	None Proposed	0	1.458	7450.38	968.5	$0.0	$485.0	$137.0	$0.0	$0.0	$137.0	$485.0	$622.0	$822.0	$2,910.0	$3,732.0
Glassboro High School - Interior Lighting	001	A102	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	1216.8	1.2168	3285	3997.188	$519.6	None Proposed	24	1216.8	1.2168	3285	3285	3997.188	3997.188	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A103	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$451.0	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A103	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$86.6	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A105	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	2112	2.112	3285	6937.92	$901.9	None Proposed	24	2112	2.112	3285	3285	6937.92	6937.92	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A105	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$86.6	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A106	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A107	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$338.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A108	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A109	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A110	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A111	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A112	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A114	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A115	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A115	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A116	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	3285	2498.2425	$324.8	None Proposed	15	760.5	0.7605	3285	3285	2498.2425	2498.2425	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A118	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	30	1521	1.521	3285	4996.485	$649.5	None Proposed	30	1521	1.521	3285	3285	4996.485	4996.485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A120	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A121	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A122	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A131	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$451.0	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A131	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	3285	1332.396	$173.2	None Proposed	8	405.6	0.4056	3285	3285	1332.396	1332.396	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A132	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A132	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	3285	1332.396	$173.2	None Proposed	8	405.6	0.4056	3285	3285	1332.396	1332.396	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A133	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$451.0	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A134	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	1008	1.008	3285	3311.28	$430.5	None Proposed	9	1008	1.008	3285	3285	3311.28	3311.28	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A134	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	1008	1.008	3285	3311.28	$430.5	None Proposed	9	1008	1.008	3285	3285	3311.28	3311.28	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A135	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$526.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A135	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$526.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A136	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$526.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A137	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$451.0	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A138	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	22	1936	1.936	3285	6359.76	$826.8	None Proposed	22	1936	1.936	3285	3285	6359.76	6359.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A139	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	18	1584	1.584	3285	5203.44	$676.4	None Proposed	18	1584	1.584	3285	3285	5203.44	5203.44	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A139	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	18	1584	1.584	3285	5203.44	$676.4	None Proposed	18	1584	1.584	3285	3285	5203.44	5203.44	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A139	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	18	1584	1.584	3285	5203.44	$676.4	None Proposed	18	1584	1.584	3285	3285	5203.44	5203.44	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A140	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	18	1584	1.584	3285	5203.44	$676.4	None Proposed	18	1584	1.584	3285	3285	5203.44	5203.44	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A140	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$150.3	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	A141	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	13	1144	1.144	3285	3758.04	$488.5	None Proposed	13	1144	1.144	3285	3285	3758.04	3758.04	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Assistant Principles Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$75.2	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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)	Occupany Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Glassboro High School - Interior Lighting	001	Assistant Principles Office	13W CFL Fixture	2	26	0.026	3285	85.41	$11.1	None Proposed	2	26	0.026	3285	3285	85.41	85.41	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Assistant Principles Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$86.6	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Auditorium	Halogen Fixture	56	5600	5.6	3285	18396	$2,391.5	None Proposed	56	5600	5.6	3285	3285	18396	18396	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	B101	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3285	1665.495	$216.5	None Proposed	10	507	0.507	3285	3285	1665.495	1665.495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	B102	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	912.6	0.9126	3285	2997.891	$389.7	None Proposed	18	912.6	0.9126	3285	3285	2997.891	2997.891	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	B103	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	912.6	0.9126	3285	2997.891	$389.7	None Proposed	18	912.6	0.9126	3285	3285	2997.891	2997.891	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	B104	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$259.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	B105	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	1008	1.008	3285	3311.28	$430.5	None Proposed	9	1008	1.008	3285	3285	3311.28	3311.28	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	B108	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	23	1166.1	1.1661	3285	3830.6385	$498.0	None Proposed	23	1166.1	1.1661	3285	3285	3830.6385	3830.6385	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	B109	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	1216.8	1.2168	3285	3997.188	$519.6	None Proposed	24	1216.8	1.2168	3285	3285	3997.188	3997.188	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Bathroom	2' 17W Fluorescent Fixture	1	15	0.015	3285	49.275	$6.4	None Proposed	1	15	0.015	3285	2299.5	49.275	34.4925	Ceiling Mounted Occupancy Sensor	1	0	14.7825	1.9	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Bathroom	2' 17W Fluorescent Fixture	1	15	0.015	3285	49.275	$6.4	None Proposed	1	15	0.015	3285	2299.5	49.275	34.4925	Ceiling Mounted Occupancy Sensor	1	0	14.7825	1.9	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	3285	1332.396	$173.2	None Proposed	8	405.6	0.4056	3285	3285	1332.396	1332.396	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Boiler Room	60W Incandescent Fixture	1	60	0.06	3285	197.1	$25.6	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	3285	3285	42.705	42.705	None Proposed	0	0.047	154.395	20.1	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$20.0	$5.0	$25.0
Glassboro High School - Interior Lighting	001	C102	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$451.0	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	C103	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$225.5	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	C104	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$225.5	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	C105	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$338.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	C107	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	26	1318.2	1.3182	3285	4330.287	$562.9	None Proposed	26	1318.2	1.3182	3285	3285	4330.287	4330.287	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	C108	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	811.2	0.8112	3285	2664.792	$346.4	None Proposed	16	811.2	0.8112	3285	3285	2664.792	2664.792	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	C109	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	16	1792	1.792	3285	5886.72	$765.3	None Proposed	16	1792	1.792	3285	3285	5886.72	5886.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Cafeteria	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	30	1521	1.521	3285	4996.485	$649.5	None Proposed	30	1521	1.521	3285	3285	4996.485	4996.485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Cafeteria	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.0508	3285	166.878	$21.7	None Proposed	2	50.8	0.0508	3285	3285	166.878	166.878	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Cafeteria	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	30	1521	1.521	3285	4996.485	$649.5	None Proposed	30	1521	1.521	3285	3285	4996.485	4996.485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Cafeteria	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.0508	3285	166.878	$21.7	None Proposed	2	50.8	0.0508	3285	3285	166.878	166.878	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Counselor	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$86.6	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Custodians Closet	13W CFL Fixture	1	13	0.013	3285	42.705	$5.6	None Proposed	1	13	0.013	3285	2299.5	42.705	29.8935	Ceiling Mounted Occupancy Sensor	1	0	12.8115	1.7	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Custodians Closet	13W CFL Fixture	1	13	0.013	3285	42.705	$5.6	None Proposed	1	13	0.013	3285	2299.5	42.705	29.8935	Ceiling Mounted Occupancy Sensor	1	0	12.8115	1.7	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Faculty Bathroom	2' 17W Fluorescent Fixture	1	15	0.015	500	7.5	$1.0	None Proposed	1	15	0.015	500	350	7.5	5.25	Ceiling Mounted Occupancy Sensor	1	0	2.25	0.3	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Faculty Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	$6.6	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Faculty Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	1216.8	1.2168	500	608.4	$79.1	None Proposed	24	1216.8	1.2168	500	350	608.4	425.88	Ceiling Mounted Occupancy Sensor	1	0	182.52	23.7	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Faculty Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.3	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Guidance	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$129.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Gym	400W Metal Halide Fixtures	39	17862	17.862	3285	58676.67	$7,628.0	Replace Metal Halide Fixtures with 6-Lamp Fluorescent Highbay Fixtures	39	8814	8.814	3285	3285	28953.99	28953.99	None Proposed	0	9.048	29722.68	3,863.9	$168.0	$105.0	$100.0	$0.0	$0.0	$100.0	$273.0	$373.0	$3,900.0	$10,647.0	$14,547.0
Glassboro High School - Interior Lighting	001	Gym	60W Incandescent Fixture	3	180	0.18	3285	591.3	$76.9	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.039	3285	3285	128.115	128.115	None Proposed	0	0.141	463.185	60.2	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$60.0	$15.0	$75.0
Glassboro High School - Interior Lighting	001	Gym Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$65.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	557.7	0.5577	4015	2239.1655	$291.1	None Proposed	11	557.7	0.5577	4015	4015	2239.1655	2239.1655	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	557.7	0.5577	4015	2239.1655	$291.1	None Proposed	11	557.7	0.5577	4015	4015	2239.1655	2239.1655	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	4015	1017.8025	$132.3	None Proposed	5	253.5	0.2535	4015	4015	1017.8025	1017.8025	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	156	7909.2	7.9092	4015	31755.438	$4,128.2	None Proposed	156	7909.2	7.9092	4015	4015	31755.438	31755.438	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	HVAC Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	$6.6	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	557.7	0.5577	3285	1832.0445	$238.2	None Proposed	11	557.7	0.5577	3285	3285	1832.0445	1832.0445	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Kitchen	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	39	3432	3.432	3285	11274.12	$1,465.6	None Proposed	39	3432	3.432	3285	3285	11274.12	11274.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Kitchen	60W Incandescent Fixture	2	120	0.12	3285	394.2	$51.2	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	3285	3285	85.41	85.41	None Proposed	0	0.094	308.79	40.1	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$40.0	$10.0	$50.0
Glassboro High School - Interior Lighting	001	Kitchen	13W CFL Fixture	8	104	0.104	3285	341.64	$44.4	None Proposed	8	104	0.104	3285	3285	341.64	341.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Library	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	58	5104	5.104	3285	16766.64	$2,179.7	None Proposed	58	5104	5.104	3285	3285	16766.64	16766.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Mail Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$21.7	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Main Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	18	2016	2.016	3285	6622.56	$860.9	None Proposed	18	2016	2.016	3285	3285	6622.56	6622.56	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Main Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$43.3	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.3	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Men's Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	$9.9	None Proposed	3	152.1	0.1521	500	350	76.05	53.235	Ceiling Mounted Occupancy Sensor	1	0	22.815	3.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Men's Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.3	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Men's Locker Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	25	1267.5	1.2675	3285	4163.7375	$541.3	None Proposed	25	1267.5	1.2675	3285	3285	4163.7375	4163.7375	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Men's Locker Room	60W Incandescent Fixture	1	60	0.06	3285	197.1	$25.6	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	3285	3285	42.705	42.705	None Proposed	0	0.047	154.395	20.1	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$20.0	$5.0	$25.0
Glassboro High School - Interior Lighting	001	Nurse	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3285	2207.52	$287.0	None Proposed	6	672	0.672	3285	3285	2207.52	2207.52	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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
Glassboro High School - Interior Lighting	001	Nurse	2' 17W Fluorescent Fixture	1	15	0.015	3285	49.275	$6.4	None Proposed	1	15	0.015	3285	3285	49.275	49.275	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Nurse	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	112	0.112	3285	367.92	$47.8	None Proposed	1	112	0.112	3285	3285	367.92	367.92	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Offices	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$43.3	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Offices	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3285	2207.52	$287.0	None Proposed	6	672	0.672	3285	3285	2207.52	2207.52	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Periodicals	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$65.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Practice Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	40	2028	2.028	3285	6661.98	$866.1	None Proposed	40	2028	2.028	3285	3285	6661.98	6661.98	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Principles Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$75.2	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Principles Office	13W CFL Fixture	2	26	0.026	3285	85.41	$11.1	None Proposed	2	26	0.026	3285	3285	85.41	85.41	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Projection Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$150.3	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Pump Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	191	9683.7	9.6837	3285	31810.9545	$4,135.4	None Proposed	191	9683.7	9.6837	3285	3285	31810.9545	31810.9545	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Showers	13W CFL Fixture	8	104	0.104	3285	341.64	$44.4	None Proposed	8	104	0.104	3285	3285	341.64	341.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Special Education	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	3285	867.24	$112.7	None Proposed	3	264	0.264	3285	3285	867.24	867.24	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Special Education	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	1014	1.014	3285	3330.99	$433.0	None Proposed	20	1014	1.014	3285	3285	3330.99	3330.99	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Stage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	1216.8	1.2168	3285	3997.188	$519.6	None Proposed	24	1216.8	1.2168	3285	3285	3997.188	3997.188	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Storage	13W CFL Fixture	1	13	0.013	500	6.5	$0.8	None Proposed	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	$9.9	None Proposed	3	152.1	0.1521	500	500	76.05	76.05	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Storage	60W Incandescent Fixture	3	180	0.18	500	90	$11.7	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.039	500	500	19.5	19.5	None Proposed	0	0.141	70.5	9.2	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$60.0	$15.0	$75.0
Glassboro High School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	$13.2	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	$13.2	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Ticket Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$21.7	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	TV Studio	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$75.2	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	TV Studio	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3285	1665.495	$216.5	None Proposed	10	507	0.507	3285	3285	1665.495	1665.495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Weight Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	44	2230.8	2.2308	3285	7328.178	$952.7	None Proposed	44	2230.8	2.2308	3285	3285	7328.178	7328.178	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$43.3	None Proposed	2	101.4	0.1014	3285	2299.5	333.099	233.1693	Ceiling Mounted Occupancy Sensor	1	0	99.9297	13.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$21.7	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	6.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Women's Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$65.0	None Proposed	3	152.1	0.1521	3285	2299.5	499.6485	349.75395	Ceiling Mounted Occupancy Sensor	1	0	149.89455	19.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Women's Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$21.7	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	6.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Women's Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$21.7	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	6.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro High School - Interior Lighting	001	Women's Locker Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3285	1665.495	$216.5	None Proposed	10	507	0.507	3285	3285	1665.495	1665.495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Women's Locker Room	13W CFL Fixture	8	104	0.104	3285	341.64	$44.4	None Proposed	8	104	0.104	3285	3285	341.64	341.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro High School - Interior Lighting	001	Wrestling Gym	400W Metal Halide Fixtures	6	2748	2.748	3285	9027.18	$1,173.5	Replace Metal Halide Fixtures with 6-Lamp Fluorescent Highbay Fixtures	6	1356	1.356	3285	3285	4454.46	4454.46	None Proposed	0	1.392	4572.72	594.5	$168.0	$105.0	$100.0	$0.0	$0.0	$100.0	$273.0	$373.0	$600.0	$1,638.0	$2,238.0
Glassboro High School - Interior Lighting	168	C107	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	5	560	0.56	3285	1839.6	$239.1	None Proposed	5	560	0.56	3285	3285	1839.6	1839.6	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Exterior Lighting	000	Exterior	Exterior Wall Packs (Assume 70w)	11	990	0.99	3285	3252.15	$455.3	Replace 70W Fixture with Induction Light Fixture	11	484	0.484	3285	3285	1589.94	1589.94	None Proposed	0	0.506	1662.21	232.7	$0.0	$380.0	$137.0	$0.0	$0.0	$137.0	$380.0	$517.0	$1,507.0	$4,180.0	$5,687.0
Glassboro Intermediate School - Exterior Lighting	000	Exterior	42W CFL Fixture	8	392	0.392	5110	2003.12	$280.4	None Proposed	8	392	0.392	5110	5110	2003.12	2003.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	000	Basement	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3285	1665.495	$233.2	None Proposed	10	507	0.507	3285	3285	1665.495	1665.495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	000	Basement	42W CFL Fixture	1	49	0.049	3285	160.965	$22.5	None Proposed	1	49	0.049	3285	3285	160.965	160.965	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	000	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	33	1673.1	1.6731	3285	5496.1335	$769.5	None Proposed	33	1673.1	1.6731	3285	2299.5	5496.1335	3847.29345	Ceiling Mounted Occupancy Sensor	1	0	1648.84005	230.8	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	000	Boiler Room	42W CFL Fixture	1	49	0.049	3285	160.965	$22.5	None Proposed	1	49	0.049	3285	2299.5	160.965	112.6755	Ceiling Mounted Occupancy Sensor	1	0	48.2895	6.8	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	001	100	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	1320	1.32	3285	4336.2	$607.1	None Proposed	15	1320	1.32	3285	3285	4336.2	4336.2	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	100	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$139.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	100	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	103	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	1216.8	1.2168	3285	3997.188	$559.6	None Proposed	24	1216.8	1.2168	3285	3285	3997.188	3997.188	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	103	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3285	735.84	$103.0	None Proposed	2	224	0.224	3285	3285	735.84	735.84	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	105	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	10	880	0.88	3285	2890.8	$404.7	None Proposed	10	880	0.88	3285	3285	2890.8	2890.8	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	106	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	3285	1332.396	$186.5	None Proposed	8	405.6	0.4056	3285	3285	1332.396	1332.396	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	106	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	106	42W CFL Fixture	2	98	0.098	3285	321.93	$45.1	None Proposed	2	98	0.098	3285	3285	321.93	321.93	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	107	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	108	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	3285	1332.396	$186.5	None Proposed	8	405.6	0.4056	3285	3285	1332.396	1332.396	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	108	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$242.8	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	109	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	116	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$242.8	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	116	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Cafeteria	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	22	1115.4	1.1154	3285	3664.089	$513.0	None Proposed	22	1115.4	1.1154	3285	3285	3664.089	3664.089	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Cafeteria	42W CFL Fixture	13	637	0.637	3285	2092.545	$293.0	None Proposed	13	637	0.637	3285	3285	2092.545	2092.545	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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
Glassboro Intermediate School - Interior Lighting	001	Cafeteria	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Closet	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Electrical Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	$7.1	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Electrical Room	60W Incandescent Fixture	2	120	0.12	500	60	$8.4	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	500	13	13	None Proposed	0	0.094	47	6.6	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$40.0	$10.0	$50.0
Glassboro Intermediate School - Interior Lighting	001	Gym	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	20	2240	2.24	3285	7358.4	$1,030.2	None Proposed	20	2240	2.24	3285	3285	7358.4	7358.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	4015	407.121	$57.0	None Proposed	2	101.4	0.1014	4015	4015	407.121	407.121	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	4015	1221.363	$171.0	None Proposed	6	304.2	0.3042	4015	4015	1221.363	1221.363	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	4015	814.242	$114.0	None Proposed	4	202.8	0.2028	4015	4015	814.242	814.242	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	912.6	0.9126	4015	3664.089	$513.0	None Proposed	18	912.6	0.9126	4015	4015	3664.089	3664.089	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	1014	1.014	4015	4071.21	$570.0	None Proposed	20	1014	1.014	4015	4015	4071.21	4071.21	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Kitchen	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	13	1144	1.144	3285	3758.04	$526.1	None Proposed	13	1144	1.144	3285	3285	3758.04	3758.04	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Kitchen	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$46.6	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Library	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	80	4056	4.056	3285	13323.96	$1,865.4	None Proposed	80	4056	4.056	3285	3285	13323.96	13323.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Library	400W Metal Halide Recessed Can	27	12366	12.366	3285	40622.31	$5,687.1	None Proposed	27	12366	12.366	3285	3285	40622.31	40622.31	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Library	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	811.2	0.8112	3285	2664.792	$373.1	None Proposed	16	811.2	0.8112	3285	3285	2664.792	2664.792	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Library	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$139.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Library	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	354.9	0.3549	3285	1165.8465	$163.2	None Proposed	7	354.9	0.3549	3285	3285	1165.8465	1165.8465	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Library	400W Metal Halide Recessed Can	12	5496	5.496	3285	18054.36	$2,527.6	None Proposed	12	5496	5.496	3285	3285	18054.36	18054.36	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Library	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$445.2	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Library	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Mechanical Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Media Center	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	23	2024	2.024	3285	6648.84	$930.8	None Proposed	23	2024	2.024	3285	3285	6648.84	6648.84	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	$10.6	None Proposed	3	152.1	0.1521	500	350	76.05	53.235	Ceiling Mounted Occupancy Sensor	1	0	22.815	3.2	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	001	Men's Locker Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	709.8	0.7098	3285	2331.693	$326.4	None Proposed	14	709.8	0.7098	3285	3285	2331.693	2331.693	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Men's Locker Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$139.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Offices	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	912.6	0.9126	3285	2997.891	$419.7	None Proposed	18	912.6	0.9126	3285	3285	2997.891	2997.891	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Offices	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$93.3	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Offices	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	3285	832.7475	$116.6	None Proposed	5	253.5	0.2535	3285	3285	832.7475	832.7475	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Offices	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	3285	832.7475	$116.6	None Proposed	5	253.5	0.2535	3285	3285	832.7475	832.7475	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Offices	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Server Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Storage	60W Incandescent Fixture	1	60	0.06	500	30	$4.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	3.3	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$20.0	$5.0	$25.0
Glassboro Intermediate School - Interior Lighting	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	$7.1	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	001	Women's Locker Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	709.8	0.7098	3285	2331.693	$326.4	None Proposed	14	709.8	0.7098	3285	3285	2331.693	2331.693	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	001	Women's Locker Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$139.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	200	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	704	0.704	3285	2312.64	$323.8	None Proposed	8	704	0.704	3285	3285	2312.64	2312.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	200	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$93.3	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	201	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	1320	1.32	3285	4336.2	$607.1	None Proposed	15	1320	1.32	3285	3285	4336.2	4336.2	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	202	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	204	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	205	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	206	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	207	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	3285	1498.9455	$209.9	None Proposed	9	456.3	0.4563	3285	3285	1498.9455	1498.9455	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	207	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	3285	867.24	$121.4	None Proposed	3	264	0.264	3285	3285	867.24	867.24	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	208	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	210	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	211	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	212	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	213	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	215	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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)	Occupany Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Glassboro Intermediate School - Interior Lighting	002	217	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$242.8	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	217	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	219	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$445.2	None Proposed	11	968	0.968	3285	3285	3179.88	3179.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	219	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	219	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	201-1	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	3285	867.24	$121.4	None Proposed	3	264	0.264	3285	3285	867.24	867.24	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	Electrical Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	Faculty Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	002	Hallway	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	27	685.8	0.6858	4015	2753.487	$385.5	None Proposed	27	685.8	0.6858	4015	4015	2753.487	2753.487	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	Hallway	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	4015	1413.28	$197.9	None Proposed	4	352	0.352	4015	4015	1413.28	1413.28	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	21	1064.7	1.0647	4015	4274.7705	$598.5	None Proposed	21	1064.7	1.0647	4015	4015	4274.7705	4274.7705	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	Men's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	002	Men's Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	002	Men's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	$10.6	None Proposed	3	152.1	0.1521	500	350	76.05	53.235	Ceiling Mounted Occupancy Sensor	1	0	22.815	3.2	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	002	Men's Bathroom	42W CFL Fixture	1	49	0.049	500	24.5	$3.4	None Proposed	1	49	0.049	500	350	24.5	17.15	Ceiling Mounted Occupancy Sensor	1	0	7.35	1.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	002	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	$7.1	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	002	Storage	60W Incandescent Fixture	1	60	0.06	500	30	$4.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	3.3	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$20.0	$5.0	$25.0
Glassboro Intermediate School - Interior Lighting	002	Women's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	002	Women's Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	002	Women's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	2299.5	499.6485	349.75395	Ceiling Mounted Occupancy Sensor	1	0	149.89455	21.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	002	Women's Bathroom	42W CFL Fixture	1	49	0.049	3285	160.965	$22.5	None Proposed	1	49	0.049	3285	2299.5	160.965	112.6755	Ceiling Mounted Occupancy Sensor	1	0	48.2895	6.8	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	003	301	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	301	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	302	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	303	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	304	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	305	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$80.9	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	306	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	307	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	308	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	310	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	312	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$46.6	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	003	Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	003	Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	003	Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	003	Custodians Closet	13W CFL Fixture	1	13	0.013	3285	42.705	$6.0	None Proposed	1	13	0.013	3285	2299.5	42.705	29.8935	Ceiling Mounted Occupancy Sensor	1	0	12.8115	1.8	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School - Interior Lighting	003	Electrical Room	60W Incandescent Fixture	1	60	0.06	500	30	$4.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	3.3	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$20.0	$5.0	$25.0
Glassboro Intermediate School - Interior Lighting	003	Hallway	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	20	508	0.508	4015	2039.62	$285.5	None Proposed	20	508	0.508	4015	4015	2039.62	2039.62	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	4015	814.242	$114.0	None Proposed	4	202.8	0.2028	4015	4015	814.242	814.242	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School - Interior Lighting	003	Stairwell	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	7	784	0.784	4015	3147.76	$440.7	None Proposed	7	784	0.784	4015	4015	3147.76	3147.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School Annex - Exterior Lighting	000	Exterior	42W CFL Fixture	5	245	0.245	5110	1251.95	$212.8	None Proposed	5	245	0.245	5110	5110	1251.95	1251.95	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School Annex - Interior Lighting	001	Classroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	2112	2.112	3285	6937.92	$1,179.4	None Proposed	24	2112	2.112	3285	3285	6937.92	6937.92	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Glassboro Intermediate School Annex - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	$12.9	None Proposed	3	152.1	0.1521	500	350	76.05	53.235	Ceiling Mounted Occupancy Sensor	1	0	22.815	3.9	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School Annex - Interior Lighting	001	PAC1	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	968	0.968	3285	3179.88	$540.6	None Proposed	11	968	0.968	3285	2299.5	3179.88	2225.916	Ceiling Mounted Occupancy Sensor	1	0	953.964	162.2	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School Annex - Interior Lighting	001	PAC3	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$589.7	None Proposed	12	1056	1.056	3285	2299.5	3468.96	2428.272	Ceiling Mounted Occupancy Sensor	1	0	1040.688	176.9	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School Annex - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$84.9	None Proposed	3	152.1	0.1521	3285	2299.5	499.6485	349.75395	Ceiling Mounted Occupancy Sensor	1	0	149.89455	25.5	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Glassboro Intermediate School Annex - Interior Lighting	001	Woodshop	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	27	1368.9	1.3689	3285	4496.8365	$764.5	None Proposed	27	1368.9	1.3689	3285	2299.5	4496.8365	3147.78555	Ceiling Mounted Occupancy Sensor	1	0	1349.05095	229.3	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
J. Harvey Rodgers School - Exterior Lighting	001	Exterior	Exterior Wall Packs (Assume 70w)	20	1800	1.8	5110	9198	$1,379.7	Replace 70W Fixture with Induction Light Fixture	20	880	0.88	5110	5110	4496.8	4496.8	None Proposed	0	0.92	4701.2	705.2	$0.0	$380.0	$137.0	$0.0	$0.0	$137.0	$380.0	$517.0	$2,740.0	$7,600.0	$10,340.0
J. Harvey Rodgers School - Exterior Lighting	001	Exterior	42W CFL Fixture	5	245	0.245	5110	1251.95	$187.8	None Proposed	5	245	0.245	5110	5110	1251.95	1251.95	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	A-1	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$607.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	A-10	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$607.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	A-2	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$607.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	A-3	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$607.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	A-4	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$607.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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
J. Harvey Rodgers School - Interior Lighting	001	A-5	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$607.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	A-6	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	13	1144	1.144	3285	3758.04	$563.7	None Proposed	13	1144	1.144	3285	3285	3758.04	3758.04	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	A-7	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$607.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	A-8	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	13	1144	1.144	3285	3758.04	$563.7	None Proposed	13	1144	1.144	3285	3285	3758.04	3758.04	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	A-9	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$607.1	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Auditorium	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	3285	4415.04	$662.3	None Proposed	12	1344	1.344	3285	3285	4415.04	4415.04	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	B-1	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	557.7	0.5577	3285	1832.0445	$274.8	None Proposed	11	557.7	0.5577	3285	3285	1832.0445	1832.0445	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	B-1	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	B-2	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	3285	2498.2425	$374.7	None Proposed	15	760.5	0.7605	3285	3285	2498.2425	2498.2425	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	B-3	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	3285	2498.2425	$374.7	None Proposed	15	760.5	0.7605	3285	3285	2498.2425	2498.2425	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	B-5	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	3285	2498.2425	$374.7	None Proposed	15	760.5	0.7605	3285	3285	2498.2425	2498.2425	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	B-6	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	3285	2498.2425	$374.7	None Proposed	15	760.5	0.7605	3285	3285	2498.2425	2498.2425	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	B-7	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	3285	2498.2425	$374.7	None Proposed	15	760.5	0.7605	3285	3285	2498.2425	2498.2425	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	B-8	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	3285	2498.2425	$374.7	None Proposed	15	760.5	0.7605	3285	3285	2498.2425	2498.2425	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Bathroom	13W CFL Fixture	1	13	0.013	3285	42.705	$6.4	None Proposed	1	13	0.013	3285	2299.5	42.705	29.8935	Ceiling Mounted Occupancy Sensor	1	0	12.8115	1.9	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
J. Harvey Rodgers School - Interior Lighting	001	Boiler Room	60W Incandescent Fixture	6	360	0.36	3285	1182.6	$177.4	Replace 60W Incandescent Fixture with 13W CFL	6	78	0.078	3285	3285	256.23	256.23	None Proposed	0	0.282	926.37	139.0	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$120.0	$30.0	$150.0
J. Harvey Rodgers School - Interior Lighting	001	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$74.9	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Custodians	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Faculty Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
J. Harvey Rodgers School - Interior Lighting	001	Faculty Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
J. Harvey Rodgers School - Interior Lighting	001	Faculty Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
J. Harvey Rodgers School - Interior Lighting	001	Faculty Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.088	500	44	$6.6	None Proposed	1	88	0.088	500	350	44	30.8	Ceiling Mounted Occupancy Sensor	1	0	13.2	2.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
J. Harvey Rodgers School - Interior Lighting	001	Gym	400W Metal Halide Fixtures	12	5496	5.496	3285	18054.36	$2,708.2	Replace Metal Halide Fixtures with 6-Lamp Fluorescent Highbay Fixtures	12	2712	2.712	3285	3285	8908.92	8908.92	None Proposed	0	2.784	9145.44	1,371.8	$168.0	$105.0	$100.0	$0.0	$0.0	$100.0	$273.0	$373.0	$1,200.0	$3,276.0	$4,476.0
J. Harvey Rodgers School - Interior Lighting	001	Gym	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$25.0	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Gym	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$86.7	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	4015	2035.605	$305.3	None Proposed	10	507	0.507	4015	4015	2035.605	2035.605	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	4015	2035.605	$305.3	None Proposed	10	507	0.507	4015	4015	2035.605	2035.605	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	19	963.3	0.9633	4015	3867.6495	$580.1	None Proposed	19	963.3	0.9633	4015	4015	3867.6495	3867.6495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	4015	3053.4075	$458.0	None Proposed	15	760.5	0.7605	4015	4015	3053.4075	3053.4075	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	4015	2035.605	$305.3	None Proposed	10	507	0.507	4015	4015	2035.605	2035.605	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	557.7	0.5577	4015	2239.1655	$335.9	None Proposed	11	557.7	0.5577	4015	4015	2239.1655	2239.1655	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	3285	832.7475	$124.9	None Proposed	5	253.5	0.2535	3285	3285	832.7475	832.7475	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Kitchen	60W Incandescent Fixture	1	60	0.06	3285	197.1	$29.6	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	3285	3285	42.705	42.705	None Proposed	0	0.047	154.395	23.2	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$20.0	$5.0	$25.0
J. Harvey Rodgers School - Interior Lighting	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$149.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Lounge	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	557.7	0.5577	3285	1832.0445	$274.8	None Proposed	11	557.7	0.5577	3285	3285	1832.0445	1832.0445	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Main Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	20	1760	1.76	3285	5781.6	$867.2	None Proposed	20	1760	1.76	3285	3285	5781.6	5781.6	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Main Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Media Center	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	22	1936	1.936	3285	6359.76	$954.0	None Proposed	22	1936	1.936	3285	3285	6359.76	6359.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Media Center	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	35	1774.5	1.7745	3285	5829.2325	$874.4	None Proposed	35	1774.5	1.7745	3285	3285	5829.2325	5829.2325	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Media Center	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$299.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Media Center	42W CFL Fixture	10	490	0.49	3285	1609.65	$241.4	None Proposed	10	490	0.49	3285	3285	1609.65	1609.65	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Men's Bathroom	13W CFL Fixture	1	13	0.013	500	6.5	$1.0	None Proposed	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0	1.95	0.3	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
J. Harvey Rodgers School - Interior Lighting	001	Men's Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	$7.6	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.3	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
J. Harvey Rodgers School - Interior Lighting	001	Music	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3285	2207.52	$331.1	None Proposed	6	672	0.672	3285	3285	2207.52	2207.52	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Nurse	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	7	616	0.616	3285	2023.56	$303.5	None Proposed	7	616	0.616	3285	3285	2023.56	2023.56	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Occupational Therapy	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$149.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Resource Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$149.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Speech	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	3285	832.7475	$124.9	None Proposed	5	253.5	0.2535	3285	3285	832.7475	832.7475	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Stage	42W CFL Fixture	2	98	0.098	3285	321.93	$48.3	None Proposed	2	98	0.098	3285	3285	321.93	321.93	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Stage	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	3285	1471.68	$220.8	None Proposed	4	448	0.448	3285	3285	1471.68	1471.68	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Storage	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	$7.6	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Storage	60W Incandescent Fixture	1	60	0.06	500	30	$4.5	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	3.5	$0.0	$5.0	$20.0	$0.0	$0.0	$20.0	$5.0	$25.0	$20.0	$5.0	$25.0
J. Harvey Rodgers School - Interior Lighting	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	$11.4	None Proposed	3	152.1	0.1521	500	500	76.05	76.05	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Tech Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
J. Harvey Rodgers School - Interior Lighting	001	Women's Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$50.0	None Proposed	2	101.4	0.1014	3285	2299.5	333.099	233.1693	Ceiling Mounted Occupancy Sensor	1	0	99.9297	15.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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)	Occupany Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Thomas E. Bowe School - Exterior Lighting	000	Exterior	Exterior Wall Packs (Assume 70w)	50	4500	4.5	5110	22995	$3,219.3	Replace 70W Fixture with Induction Light Fixture	50	2200	2.2	5110	5110	11242	11242	None Proposed	0	2.3	11753	1,645.4	$0.0	$380.0	$137.0	$0.0	$0.0	$137.0	$380.0	$517.0	$6,850.0	$19,000.0	$25,850.0
Thomas E. Bowe School - Exterior Lighting	000	Exterior	42W CFL Fixture	40	1960	1.96	5110	10015.6	$1,402.2	None Proposed	40	1960	1.96	5110	5110	10015.6	10015.6	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Exterior Lighting	000	Exterior	Pole Mounted Luminare - 1 Head (Assume 400W MH)	19	8702	8.702	5110	44467.22	$6,225.4	Replace 400W Fixture with Induction Light Fixture	19	4085	4.085	5110	5110	20874.35	20874.35	None Proposed	0	4.617	23592.87	3,303.0	$0.0	$485.0	$137.0	$0.0	$0.0	$137.0	$485.0	$622.0	$2,603.0	$9,215.0	$11,818.0
Thomas E. Bowe School - Interior Lighting	001	A102	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	25	2200	2.2	3285	7227	$1,011.8	None Proposed	25	2200	2.2	3285	3285	7227	7227	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	A114	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$242.8	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Art	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	33	1673.1	1.6731	3285	5496.1335	$769.5	None Proposed	33	1673.1	1.6731	3285	3285	5496.1335	5496.1335	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B104	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	14	1232	1.232	3285	4047.12	$566.6	None Proposed	14	1232	1.232	3285	3285	4047.12	4047.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B104	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B106	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B107	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B109	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B111	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$242.8	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B112	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B113	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B114	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$242.8	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B121	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B122	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B127	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$161.9	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B137	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	5	440	0.44	3285	1445.4	$202.4	None Proposed	5	440	0.44	3285	3285	1445.4	1445.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B137	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B143	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B144	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B145	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B146	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	B147	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	1320	1.32	3285	4336.2	$607.1	None Proposed	15	1320	1.32	3285	3285	4336.2	4336.2	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.088	3285	289.08	$40.5	None Proposed	1	88	0.088	3285	2299.5	289.08	202.356	Ceiling Mounted Occupancy Sensor	1	0	86.724	12.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	3285	1332.396	$186.5	None Proposed	8	405.6	0.4056	3285	2299.5	1332.396	932.6772	Ceiling Mounted Occupancy Sensor	1	0	399.7188	56.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$279.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C104	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C105	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.088	3285	289.08	$40.5	None Proposed	1	88	0.088	3285	3285	289.08	289.08	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C107	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C108	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	10	880	0.88	3285	2890.8	$404.7	None Proposed	10	880	0.88	3285	3285	2890.8	2890.8	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C108	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$46.6	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C111	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C112	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$242.8	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C113	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C114	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C115	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3285	1734.48	$242.8	None Proposed	6	528	0.528	3285	3285	1734.48	1734.48	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C121	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C122	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	3285	867.24	$121.4	None Proposed	3	264	0.264	3285	3285	867.24	867.24	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C123	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	704	0.704	3285	2312.64	$323.8	None Proposed	8	704	0.704	3285	3285	2312.64	2312.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C126	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$279.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C126	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3285	2601.72	$364.2	None Proposed	9	792	0.792	3285	3285	2601.72	2601.72	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C136	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	5	440	0.44	3285	1445.4	$202.4	None Proposed	5	440	0.44	3285	3285	1445.4	1445.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C136	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C137	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C139	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C141	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C142	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C143	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	C144	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3285	3468.96	$485.7	None Proposed	12	1056	1.056	3285	3285	3468.96	3468.96	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Cafeteria	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	35	1774.5	1.7745	3285	5829.2325	$816.1	None Proposed	35	1774.5	1.7745	3285	3285	5829.2325	5829.2325	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Closet	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Conference Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$161.9	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Appendix D - Lighting Upgrades

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	Qty of Existing Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	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)	Occupany Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Thomas E. Bowe School - Interior Lighting	001	Guidance	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$161.9	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Gym	400W Metal Halide Fixtures	32	14656	14.656	3285	48144.96	$6,740.3	Replace Metal Halide Fixtures with 6-Lamp Fluorescent Highbay Fixtures	32	7232	7.232	3285	3285	23757.12	23757.12	None Proposed	0	7.424	24387.84	3,414.3	$168.0	$105.0	$100.0	$0.0	$0.0	$100.0	$273.0	$373.0	$3,200.0	$8,736.0	$11,936.0
Thomas E. Bowe School - Interior Lighting	001	Gym	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$46.6	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	4015	814.242	$114.0	None Proposed	4	202.8	0.2028	4015	4015	814.242	814.242	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	4015	1221.363	$171.0	None Proposed	6	304.2	0.3042	4015	4015	1221.363	1221.363	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	4015	1832.0445	$256.5	None Proposed	9	456.3	0.4563	4015	4015	1832.0445	1832.0445	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	4015	2035.605	$285.0	None Proposed	10	507	0.507	4015	4015	2035.605	2035.605	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	4015	814.242	$114.0	None Proposed	4	202.8	0.2028	4015	4015	814.242	814.242	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	811.2	0.8112	4015	3256.968	$456.0	None Proposed	16	811.2	0.8112	4015	4015	3256.968	3256.968	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	709.8	0.7098	4015	2849.847	$399.0	None Proposed	14	709.8	0.7098	4015	4015	2849.847	2849.847	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	4015	1628.484	$228.0	None Proposed	8	405.6	0.4056	4015	4015	1628.484	1628.484	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	4015	1017.8025	$142.5	None Proposed	5	253.5	0.2535	4015	4015	1017.8025	1017.8025	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	4015	203.5605	$28.5	None Proposed	1	50.7	0.0507	4015	4015	203.5605	203.5605	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	912.6	0.9126	4015	3664.089	$513.0	None Proposed	18	912.6	0.9126	4015	4015	3664.089	3664.089	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	30	1521	1.521	4015	6106.815	$855.0	None Proposed	30	1521	1.521	4015	4015	6106.815	6106.815	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	354.9	0.3549	4015	1424.9235	$199.5	None Proposed	7	354.9	0.3549	4015	4015	1424.9235	1424.9235	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	811.2	0.8112	4015	3256.968	$456.0	None Proposed	16	811.2	0.8112	4015	4015	3256.968	3256.968	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	4015	814.242	$114.0	None Proposed	4	202.8	0.2028	4015	4015	814.242	814.242	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Kitchen	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	13	659.1	0.6591	3285	2165.1435	$303.1	None Proposed	13	659.1	0.6591	3285	3285	2165.1435	2165.1435	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Kitchen	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	3285	499.6485	499.6485	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Kitchen	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$93.3	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Library	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	51	2585.7	2.5857	3285	8494.0245	$1,189.2	None Proposed	51	2585.7	2.5857	3285	3285	8494.0245	8494.0245	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Lounge	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3285	1998.594	$279.8	None Proposed	12	608.4	0.6084	3285	3285	1998.594	1998.594	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Lounge	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	704	0.704	3285	2312.64	$323.8	None Proposed	8	704	0.704	3285	3285	2312.64	2312.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	500	152.1	$21.3	None Proposed	6	304.2	0.3042	500	350	152.1	106.47	Ceiling Mounted Occupancy Sensor	1	0	45.63	6.4	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Men's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	$10.6	None Proposed	3	152.1	0.1521	500	350	76.05	53.235	Ceiling Mounted Occupancy Sensor	1	0	22.815	3.2	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Men's Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	$3.5	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.1	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Music	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	704	0.704	3285	2312.64	$323.8	None Proposed	8	704	0.704	3285	3285	2312.64	2312.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Music	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Nurse	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	5	440	0.44	3285	1445.4	$202.4	None Proposed	5	440	0.44	3285	3285	1445.4	1445.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Nurse	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3285	333.099	$46.6	None Proposed	2	101.4	0.1014	3285	3285	333.099	333.099	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Nurse	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3285	578.16	$80.9	None Proposed	2	176	0.176	3285	3285	578.16	578.16	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Nurse	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.088	3285	289.08	$40.5	None Proposed	1	88	0.088	3285	3285	289.08	289.08	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$139.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3285	1156.32	$161.9	None Proposed	4	352	0.352	3285	3285	1156.32	1156.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	7	616	0.616	3285	2023.56	$283.3	None Proposed	7	616	0.616	3285	3285	2023.56	2023.56	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	3285	166.5495	166.5495	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3285	666.198	$93.3	None Proposed	4	202.8	0.2028	3285	3285	666.198	666.198	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$139.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$139.9	None Proposed	6	304.2	0.3042	3285	3285	999.297	999.297	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	500	202.8	$28.4	None Proposed	8	405.6	0.4056	500	500	202.8	202.8	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Thomas E. Bowe School - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3285	999.297	$139.9	None Proposed	6	304.2	0.3042	3285	2299.5	999.297	699.5079	Ceiling Mounted Occupancy Sensor	1	0	299.7891	42.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Women's Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3285	499.6485	$70.0	None Proposed	3	152.1	0.1521	3285	2299.5	499.6485	349.75395	Ceiling Mounted Occupancy Sensor	1	0	149.89455	21.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5
Thomas E. Bowe School - Interior Lighting	001	Women's Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3285	166.5495	$23.3	None Proposed	1	50.7	0.0507	3285	2299.5	166.5495	116.58465	Ceiling Mounted Occupancy Sensor	1	0	49.96485	7.0	$0.0	$0.0	$0.0	$103.0	$73.5	$0.0	$0.0	$0.0	$73.5	$103.0	$176.5

APPENDIX E

SOLAR ENERGY FINANCING WORKSHEET

Glassboro High School
Design Goal: Provide
55% of average annual electricity

Existing Conditons

Average Annual Electrical Usage (kWh)	1,525,658
Current Utility Price ($/kWh)	0.13
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating (Zip Code: 08028)	4.70 kWh/sq-m/day
Solar Capacity Required (kW)	684.492
Roof Space Needed (sq-ft)	68,449.20
Annual Solar kWh (PV Watts)	845,735
Net System installation Cost ($9/kWh)	$6,160,428
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$6,260,428**
Materials	$4,382,300
Labor	$1,878,128
Engineers Opinion of Probable Cost	$7,825,535

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	SREC Factor ($/kWh)*	REC Factor
Install									
1	0.1300	845,735.0	$109,945.6	$571,478	($16,915)	$664,508.9	$664,508.9	$0.676	
2	0.1339	841,506.3	$112,677.7	$554,405	($16,830)	$650,252.7	$1,314,761.6	$0.659	
3	0.1379	837,298.8	$115,477.7	$537,677	($16,746)	$636,408.5	$1,951,170.1	$0.642	
4	0.1421	833,112.3	$118,347.4	$518,939	($16,662)	$620,623.9	$2,571,794.0	$0.623	
5	0.1463	828,946.7	$121,288.3	$500,854	($16,579)	$605,563.1	$3,177,357.1	$0.604	
6	0.1507	824,802.0	$124,302.3	$483,399	($16,496)	$591,205.2	$3,768,562.3	$0.586	
7	0.1552	820,678.0	$127,391.2	$466,553	($16,414)	$577,530.2	$4,346,092.5	$0.568	
8	0.1599	816,574.6	$130,556.9	$450,293	($16,331)	$564,518.6	$4,910,611.0	$0.551	
9	0.1647	812,491.7	$133,801.2	$434,600	($16,250)	$552,151.8	$5,462,762.9	$0.535	
10	0.1696	808,429.3	$137,126.2	$419,455	($16,169)	$540,412.2	$6,003,175.1	$0.519	
11	0.1747	804,387.1	$140,533.8	$404,837	($16,088)	$529,282.7	$6,532,457.8	$0.503	
12	0.1800	800,365.2	$144,026.0	$390,728	($16,007)	$518,746.8	$7,051,204.6	$0.488	
13	0.1853	796,363.4	$147,605.1	$377,111	($15,927)	$508,789.0	$7,559,993.6	$0.474	
14	0.1909	792,381.5	$151,273.1	$363,969	($15,848)	$499,394.3	$8,059,387.9	$0.459	
15	0.1966	788,419.6	$155,032.2	$351,285	($15,768)	$490,548.4	$8,549,936.3	$0.446	
16	0.2025	784,477.5	$158,884.8	$19,612	($15,690)	$162,807.1	$8,712,743.5		2.50%
17	0.2086	780,555.2	$162,833.0	$19,514	($15,611)	$166,735.8	$8,879,479.3		2.50%
18	0.2149	776,652.4	$166,879.4	$19,416	($15,533)	$170,762.7	$9,050,242.0		2.50%
19	0.2213	772,769.1	$171,026.4	$19,319	($15,455)	$174,890.2	$9,225,132.2		2.50%
20	0.2280	768,905.3	$175,276.4	$19,223	($15,378)	$179,120.9	$9,404,253.2		2.50%
21	0.2348	765,060.7	$179,632.0	$19,127	($15,301)	$183,457.3	$9,587,710.5		2.50%
22	0.2418	761,235.4	$184,095.9	$19,031	($15,225)	$187,902.1	$9,775,612.5		2.50%
23	0.2491	757,429.3	$188,670.7	$18,936	($15,149)	$192,457.8	$9,968,070.4		2.50%
24	0.2566	753,642.1	$193,359.1	$18,841	($15,073)	$197,127.3	$10,165,197.7		2.50%
25	0.2643	749,873.9	$198,164.1	$18,747	($14,997)	$201,913.5	$10,367,111.2		2.50%

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Glassboro Intermediate School
Design Goal: Provide
8% of average annual electricity

Existing Conditons

Average Annual Electrical Usage (kWh)	932,733
Current Utility Price ($/kWh)	$0.1400
Actual SREC Market Values (January 2010-I	$110/MWh - $700/MWh

Calculations

Solar Rating (Zip Code: 08028)	4.70 kWh/sq-m/day
Solar Capacity Required (kW)	59.186
Roof Space Needed (sq-ft)	5918.6
Annual Solar kWh (PV Watts)	73,128
Net System installation Cost ($9/kWh)	$532,674
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$632,674**
Materials	$442,872
Labor	$189,802
Engineers Opinion of Probable Cost	$790,843

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	SREC Factor ($/kWh)*	REC Factor
Install									
1	0.1400	73,128.0	$10,237.9	$49,414	($1,463)	$58,189.2	$58,189.2	$0.676	
2	0.1442	72,762.4	$10,492.3	$47,938	($1,455)	$56,974.7	$115,164.0	$0.659	
3	0.1485	72,398.5	$10,753.1	$46,491	($1,448)	$55,796.3	$170,960.2	$0.642	
4	0.1530	72,036.6	$11,020.3	$44,871	($1,441)	$54,450.5	$225,410.8	$0.623	
5	0.1576	71,676.4	$11,294.1	$43,307	($1,434)	$53,167.8	$278,578.6	$0.604	
6	0.1623	71,318.0	$11,574.8	$41,798	($1,426)	$51,946.4	$330,525.0	$0.586	
7	0.1672	70,961.4	$11,862.4	$40,341	($1,419)	$50,784.5	$381,309.5	$0.568	
8	0.1722	70,606.6	$12,157.2	$38,935	($1,412)	$49,680.5	$430,990.0	$0.551	
9	0.1773	70,253.6	$12,459.3	$37,579	($1,405)	$48,632.8	$479,622.7	$0.535	
10	0.1827	69,902.3	$12,768.9	$36,269	($1,398)	$47,639.8	$527,262.5	$0.519	
11	0.1881	69,552.8	$13,086.2	$35,005	($1,391)	$46,700.1	$573,962.6	$0.503	
12	0.1938	69,205.0	$13,411.4	$33,785	($1,384)	$45,812.3	$619,775.0	$0.488	
13	0.1996	68,859.0	$13,744.7	$32,608	($1,377)	$44,975.1	$664,750.1	$0.474	
14	0.2056	68,514.7	$14,086.3	$31,471	($1,370)	$44,187.2	$708,937.3	$0.459	
15	0.2118	68,172.1	$14,436.3	$30,374	($1,363)	$43,447.3	$752,384.6	$0.446	
16	0.2181	67,831.3	$14,795.0	1,696	($1,357)	$15,134.2	$767,518.8		2.500%
17	0.2247	67,492.1	$15,162.7	1,687	($1,350)	$15,500.2	$783,019.0		2.500%
18	0.2314	67,154.6	$15,539.5	1,679	($1,343)	$15,875.3	$798,894.2		2.500%
19	0.2383	66,818.9	$15,925.7	1,670	($1,336)	$16,259.7	$815,154.0		2.500%
20	0.2455	66,484.8	$16,321.4	1,662	($1,330)	$16,653.8	$831,807.8		2.500%
21	0.2529	66,152.4	$16,727.0	1,654	($1,323)	$17,057.8	$848,865.6		2.500%
22	0.2604	65,821.6	$17,142.7	1,646	($1,316)	$17,471.8	$866,337.3		2.500%
23	0.2683	65,492.5	$17,568.7	1,637	($1,310)	$17,896.1	$884,233.4		2.500%
24	0.2763	65,165.0	$18,005.2	1,629	($1,303)	$18,331.1	$902,564.5		2.500%
25	0.2846	64,839.2	$18,452.7	1,621	($1,297)	$18,776.9	$921,341.4		2.500%

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Glassboro Intermediate School Annex
Design Goal: Provide
87% of average annual electricity

Existing Conditons

Average Annual Electrical Usage (kWh)	7,119
Current Utility Price ($/kWh)	$0.1700
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating (Zip Code: 08028)	4.70 kWh/sq-m/day
Solar Capacity Required (kW)	5
Roof Space Needed (sq-ft)	500
Annual Solar kWh (PV Watts)	6,178
Net System installation Cost ($9/kWh)	$45,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$145,000**
Materials	$101,500
Labor	$43,500
Engineers Opinion of Probable Cost	$181,250

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	SREC Factor ($/kWh)*	REC Factor
Install									
1	0.1700	6,178.0	$1,050.3	$4,175	($124)	$5,101.3	$5,101.3	$0.676	
2	0.1751	6,147.1	$1,076.4	$4,050	($123)	$5,003.3	$10,104.6	$0.659	
3	0.1804	6,116.4	$1,103.1	$3,928	($122)	$4,908.4	$15,013.0	$0.642	
4	0.1858	6,085.8	$1,130.5	$3,791	($122)	$4,799.6	$19,812.6	$0.623	
5	0.1913	6,055.4	$1,158.6	$3,659	($121)	$4,696.2	$24,508.8	$0.604	
6	0.1971	6,025.1	$1,187.4	$3,531	($121)	$4,598.1	$29,106.9	$0.586	
7	0.2030	5,995.0	$1,216.9	$3,408	($120)	$4,505.1	$33,612.0	$0.568	
8	0.2091	5,965.0	$1,247.2	$3,289	($119)	$4,417.2	$38,029.2	$0.551	
9	0.2154	5,935.2	$1,278.1	$3,175	($119)	$4,334.1	$42,363.3	$0.535	
10	0.2218	5,905.5	$1,309.9	$3,064	($118)	$4,255.9	$46,619.2	$0.519	
11	0.2285	5,876.0	$1,342.5	$2,957	($118)	$4,182.2	$50,801.4	$0.503	
12	0.2353	5,846.6	$1,375.8	$2,854	($117)	$4,113.1	$54,914.5	$0.488	
13	0.2424	5,817.3	$1,410.0	$2,755	($116)	$4,048.4	$58,962.9	$0.474	
14	0.2497	5,788.3	$1,445.0	$2,659	($116)	$3,988.0	$62,951.0	$0.459	
15	0.2571	5,759.3	$1,481.0	$2,566	($115)	$3,931.9	$66,882.8	$0.446	
16	0.2649	5,730.5	$1,517.8	$143	($115)	$1,546.4	$68,429.2		2.500%
17	0.2728	5,701.9	$1,555.5	$143	($114)	$1,584.0	$70,013.2		2.500%
18	0.2810	5,673.4	$1,594.1	$142	($113)	$1,622.5	$71,635.7		2.500%
19	0.2894	5,645.0	$1,633.7	$141	($113)	$1,662.0	$73,297.7		2.500%
20	0.2981	5,616.8	$1,674.3	$140	($112)	$1,702.4	$75,000.1		2.500%
21	0.3070	5,588.7	$1,715.9	$140	($112)	$1,743.9	$76,744.0		2.500%
22	0.3163	5,560.7	$1,758.6	$139	($111)	$1,786.4	$78,530.4		2.500%
23	0.3257	5,532.9	$1,802.3	$138	($111)	$1,830.0	$80,360.3		2.500%
24	0.3355	5,505.3	$1,847.1	$138	($110)	$1,874.6	$82,234.9		2.500%
25	0.3456	5,477.7	$1,893.0	$137	($110)	$1,920.4	$84,155.3		2.500%

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Dorothy Bullock School
Design Goal: Provide
54% of average annual electricity

Existing Conditons

Current Average Annual Electrical Usage (kWh)	998,756
Current Utility Price ($/kWh)	$0.1500
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating (Zip Code: 08028)	4.70 kWh/sq-m/day
Solar Capacity Required (kW)	437.415
Roof Space Needed (sq-ft)	43741.5
Annual Solar kWh (PV Watts)	540,455
Net System installation Cost ($9/kWh)	$3,936,735
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$4,036,735**
Materials	$2,825,715
Labor	$1,211,021
Engineers Opinion of Probable Cost	$5,045,919

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	SREC Factor ($/kWh)*	REC Factor
Install									
1	0.1500	540,455.0	$81,068.3	$365,195	($10,809)	$435,454.1	$435,454.1	$0.676	
2	0.1545	537,752.7	$83,082.8	$354,285	($10,755)	$426,612.5	$862,066.6	$0.659	
3	0.1591	535,064.0	$85,147.4	$343,595	($10,701)	$418,040.9	$1,280,107.5	$0.642	
4	0.1639	532,388.6	$87,263.3	$331,620	($10,648)	$408,236.0	$1,688,343.5	$0.623	
5	0.1688	529,726.7	$89,431.8	$320,063	($10,595)	$398,900.8	$2,087,244.3	$0.604	
6	0.1739	527,078.1	$91,654.2	$308,909	($10,542)	$390,021.9	$2,477,266.2	$0.586	
7	0.1791	524,442.7	$93,931.8	$298,144	($10,489)	$381,586.7	$2,858,852.9	$0.568	
8	0.1845	521,820.5	$96,266.0	$287,753	($10,436)	$373,583.1	$3,232,436.0	$0.551	
9	0.1900	519,211.4	$98,658.2	$277,725	($10,384)	$365,999.3	$3,598,435.3	$0.535	
10	0.1957	516,615.3	$101,109.9	$268,047	($10,332)	$358,824.1	$3,957,259.4	$0.519	
11	0.2016	514,032.2	$103,622.4	$258,705	($10,281)	$352,046.9	$4,309,306.3	$0.503	
12	0.2076	511,462.1	$106,197.5	$249,689	($10,229)	$345,657.5	$4,654,963.8	$0.488	
13	0.2139	508,904.8	$108,836.5	$240,988	($10,178)	$339,646.0	$4,994,609.8	$0.474	
14	0.2203	506,360.2	$111,541.1	$232,589	($10,127)	$334,003.0	$5,328,612.8	$0.459	
15	0.2269	503,828.4	$114,312.9	$224,483	($10,077)	$328,719.7	$5,657,332.5	$0.446	
16	0.2337	501,309.3	$117,153.5	$12,533	($10,026)	$119,660.1	$5,776,992.6		2.50%
17	0.2407	498,802.7	$120,064.8	$12,470	($9,976)	$122,558.8	$5,899,551.4		2.50%
18	0.2479	496,308.7	$123,048.4	$12,408	($9,926)	$125,529.9	$6,025,081.3		2.50%
19	0.2554	493,827.2	$126,106.2	$12,346	($9,877)	$128,575.3	$6,153,656.6		2.50%
20	0.2630	491,358.0	$129,239.9	$12,284	($9,827)	$131,696.7	$6,285,353.3		2.50%
21	0.2709	488,901.3	$132,451.5	$12,223	($9,778)	$134,896.0	$6,420,249.3		2.50%
22	0.2790	486,456.8	$135,742.9	$12,161	($9,729)	$138,175.2	$6,558,424.5		2.50%
23	0.2874	484,024.5	$139,116.1	$12,101	($9,680)	$141,536.3	$6,699,960.8		2.50%
24	0.2960	481,604.3	$142,573.2	$12,040	($9,632)	$144,981.2	$6,844,942.0		2.50%
25	0.3049	479,196.3	$146,116.1	$11,980	($9,584)	$148,512.1	$6,993,454.1		2.50%

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Thomas E. Bowe School
Design Goal: Provide
60% of average annual electricity

Existing Conditons

Current Average Annual Electrical Usage (kWh)	986,902
Current Utility Price ($/kWh)	$0.1400
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating (Zip Code: 08028)	4.70 kWh/sq-m/day
Solar Capacity Required (kW)	476.99
Roof Space Needed (sq-ft)	47699
Annual Solar kWh (PV Watts)	589,353
Net System installation Cost ($9/kWh)	$4,292,910
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$4,392,910**
Materials	$3,075,037
Labor	$1,317,873
Engineers Opinion of Probable Cost	$5,491,138

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	SREC Factor ($/kWh)*	REC Factor
Install									
1	0.1400	589,353.0	$82,509.4	$398,236	($11,787)	$468,958.6	$468,958.6	$0.676	
2	0.1442	586,406.2	$84,559.8	$386,339	($11,728)	$459,170.5	$928,129.1	$0.659	
3	0.1485	583,474.2	$86,661.1	$374,682	($11,669)	$449,673.3	$1,377,802.4	$0.642	
4	0.1530	580,556.8	$88,814.6	$361,624	($11,611)	$438,827.5	$1,816,629.9	$0.623	
5	0.1576	577,654.0	$91,021.7	$349,021	($11,553)	$428,490.0	$2,245,119.9	$0.604	
6	0.1623	574,765.8	$93,283.5	$336,858	($11,495)	$418,646.3	$2,663,766.2	$0.586	
7	0.1672	571,891.9	$95,601.6	$325,119	($11,438)	$409,282.3	$3,073,048.6	$0.568	
8	0.1722	569,032.5	$97,977.3	$313,788	($11,381)	$400,384.9	$3,473,433.4	$0.551	
9	0.1773	566,187.3	$100,412.1	$302,853	($11,324)	$391,941.0	$3,865,374.4	$0.535	
10	0.1827	563,356.4	$102,907.3	$292,298	($11,267)	$383,938.4	$4,249,312.8	$0.519	
11	0.1881	560,539.6	$105,464.6	$282,112	($11,211)	$376,365.4	$4,625,678.2	$0.503	
12	0.1938	557,736.9	$108,085.4	$272,280	($11,155)	$369,210.7	$4,994,888.9	$0.488	
13	0.1996	554,948.2	$110,771.3	$262,791	($11,099)	$362,463.4	$5,357,352.3	$0.474	
14	0.2056	552,173.5	$113,524.0	$253,633	($11,043)	$356,113.3	$5,713,465.6	$0.459	
15	0.2118	549,412.6	$116,345.0	$244,794	($10,988)	$350,150.5	$6,063,616.1	$0.446	
16	0.2181	546,665.6	$119,236.2	$13,667	($10,933)	$121,969.5	$6,185,585.6		2.50%
17	0.2247	543,932.2	$122,199.2	$13,598	($10,879)	$124,918.9	$6,310,504.5		2.50%
18	0.2314	541,212.6	$125,235.9	$13,530	($10,824)	$127,941.9	$6,438,446.4		2.50%
19	0.2383	538,506.5	$128,348.0	$13,463	($10,770)	$131,040.5	$6,569,486.9		2.50%
20	0.2455	535,814.0	$131,537.4	$13,395	($10,716)	$134,216.5	$6,703,703.4		2.50%
21	0.2529	533,134.9	$134,806.1	$13,328	($10,663)	$137,471.8	$6,841,175.2		2.50%
22	0.2604	530,469.2	$138,156.1	$13,262	($10,609)	$140,808.4	$6,981,983.7		2.50%
23	0.2683	527,816.9	$141,589.2	$13,195	($10,556)	$144,228.3	$7,126,212.0		2.50%
24	0.2763	525,177.8	$145,107.7	$13,129	($10,504)	$147,733.6	$7,273,945.6		2.50%
25	0.2846	522,551.9	$148,713.7	$13,064	($10,451)	$151,326.4	$7,425,272.0		2.50%

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

J. Harvey Rodgers School
Design Goal: Provide
89% of average annual electricity

Existing Conditons

Current Average Annual Electrical Usage (kWh)	379,173
Current Utility Price ($/kWh)	$0.1500
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating (Zip Code: 08028)	4.70 kWh/sq-m/day
Solar Capacity Required (kW)	274.232
Roof Space Needed (sq-ft)	27423.2
Annual Solar kWh (PV Watts)	338,832
Net System installation Cost ($9/kWh)	$2,468,088
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$2,568,088**
Materials	$1,797,662
Labor	$770,426
Engineers Opinion of Probable Cost	$3,210,110

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	SREC Factor ($/kWh)*	REC Factor
Install									
1	0.1500	338,832.0	$50,824.8	$228,955	($6,777)	$273,002.9	$273,002.9	$0.676	
2	0.1545	337,137.8	$52,087.8	$222,115	($6,743)	$267,459.8	$540,462.7	$0.659	
3	0.1591	335,452.2	$53,382.2	$215,413	($6,709)	$262,085.9	$802,548.6	$0.642	
4	0.1639	333,774.9	$54,708.7	$207,906	($6,675)	$255,938.8	$1,058,487.4	$0.623	
5	0.1688	332,106.0	$56,068.2	$200,660	($6,642)	$250,086.2	$1,308,573.6	$0.604	
6	0.1739	330,445.5	$57,461.5	$193,667	($6,609)	$244,519.7	$1,553,093.3	$0.586	
7	0.1791	328,793.3	$58,889.5	$186,918	($6,576)	$239,231.4	$1,792,324.7	$0.568	
8	0.1845	327,149.3	$60,352.9	$180,404	($6,543)	$234,213.6	$2,026,538.3	$0.551	
9	0.1900	325,513.5	$61,852.6	$174,117	($6,510)	$229,459.0	$2,255,997.3	$0.535	
10	0.1957	323,886.0	$63,389.7	$168,049	($6,478)	$224,960.6	$2,480,957.9	$0.519	
11	0.2016	322,266.5	$64,964.9	$162,192	($6,445)	$220,711.7	$2,701,669.7	$0.503	
12	0.2076	320,655.2	$66,579.3	$156,540	($6,413)	$216,706.0	$2,918,375.6	$0.488	
13	0.2139	319,051.9	$68,233.8	$151,084	($6,381)	$212,937.1	$3,131,312.7	$0.474	
14	0.2203	317,456.7	$69,929.4	$145,819	($6,349)	$209,399.3	$3,340,712.0	$0.459	
15	0.2269	315,869.4	$71,667.1	$140,737	($6,317)	$206,087.0	$3,546,799.1	$0.446	
16	0.2337	314,290.0	$73,448.0	$7,857	($6,286)	$75,019.5	$3,621,818.6		2.50%
17	0.2407	312,718.6	$75,273.2	$7,818	($6,254)	$76,836.8	$3,698,655.4		2.50%
18	0.2479	311,155.0	$77,143.8	$7,779	($6,223)	$78,699.5	$3,777,354.9		2.50%
19	0.2554	309,599.2	$79,060.8	$7,740	($6,192)	$80,608.8	$3,857,963.7		2.50%
20	0.2630	308,051.2	$81,025.5	$7,701	($6,161)	$82,565.7	$3,940,529.4		2.50%
21	0.2709	306,511.0	$83,038.9	$7,663	($6,130)	$84,571.5	$4,025,100.9		2.50%
22	0.2790	304,978.4	$85,102.5	$7,624	($6,100)	$86,627.3	$4,111,728.3		2.50%
23	0.2874	303,453.5	$87,217.3	$7,586	($6,069)	$88,734.5	$4,200,462.8		2.50%
24	0.2960	301,936.3	$89,384.6	$7,548	($6,039)	$90,894.3	$4,291,357.1		2.50%
25	0.3049	300,426.6	$91,605.8	$7,511	($6,009)	$93,107.9	$4,384,465.0		2.50%

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Elsmere School
Design Goal: Provide
48% of average annual electricity

Existing Conditons

Current Average Annual Electrical Usage (kWh)	25,675
Current Utility Price ($/kWh)	$0.1600
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating (Zip Code: 08028)	4.70 kWh/sq-m/day
Solar Capacity Required (kW)	10
Roof Space Needed (sq-ft)	1000
Annual Solar kWh (PV Watts)	12,356
Net System installation Cost ($9/kWh)	$90,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$190,000**
Materials	$133,000
Labor	$57,000
Engineers Opinion of Probable Cost	$237,500

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	SREC Factor ($/kWh)*	REC Factor
Install									
1	0.1600	12,356.0	$1,977.0	$8,349	($247)	$10,079.0	$10,079.0	$0.676	
2	0.1648	12,294.2	$2,026.1	$8,100	($246)	$9,879.9	$19,958.9	$0.659	
3	0.1697	12,232.7	$2,076.4	$7,855	($245)	$9,687.1	$29,646.1	$0.642	
4	0.1748	12,171.6	$2,128.0	$7,582	($243)	$9,466.2	$39,112.2	$0.623	
5	0.1801	12,110.7	$2,180.9	$7,317	($242)	$9,256.1	$48,368.3	$0.604	
6	0.1855	12,050.2	$2,235.1	$7,062	($241)	$9,056.5	$57,424.8	$0.586	
7	0.1910	11,989.9	$2,290.7	$6,816	($240)	$8,867.1	$66,291.9	$0.568	
8	0.1968	11,930.0	$2,347.6	$6,579	($239)	$8,687.7	$74,979.5	$0.551	
9	0.2027	11,870.3	$2,405.9	$6,349	($237)	$8,517.9	$83,497.4	$0.535	
10	0.2088	11,811.0	$2,465.7	$6,128	($236)	$8,357.6	$91,855.1	$0.519	
11	0.2150	11,751.9	$2,527.0	$5,915	($235)	$8,206.5	$100,061.6	$0.503	
12	0.2215	11,693.2	$2,589.8	$5,708	($234)	$8,064.4	$108,125.9	$0.488	
13	0.2281	11,634.7	$2,654.1	$5,510	($233)	$7,930.9	$116,056.9	$0.474	
14	0.2350	11,576.5	$2,720.1	$5,318	($232)	$7,806.1	$123,862.9	$0.459	
15	0.2420	11,518.6	$2,787.7	$5,132	($230)	$7,689.5	$131,552.4	$0.446	
16	0.2493	11,461.0	$2,856.9	$287	($229)	$2,914.3	$134,466.7		2.50%
17	0.2568	11,403.7	$2,927.9	$285	($228)	$2,985.0	$137,451.6		2.50%
18	0.2645	11,346.7	$3,000.7	$284	($227)	$3,057.4	$140,509.1		2.50%
19	0.2724	11,290.0	$3,075.3	$282	($226)	$3,131.7	$143,640.8		2.50%
20	0.2806	11,233.5	$3,151.7	$281	($225)	$3,207.9	$146,848.7		2.50%
21	0.2890	11,177.4	$3,230.0	$279	($224)	$3,285.9	$150,134.6		2.50%
22	0.2976	11,121.5	$3,310.3	$278	($222)	$3,365.9	$153,500.4		2.50%
23	0.3066	11,065.9	$3,392.5	$277	($221)	$3,447.9	$156,948.3		2.50%
24	0.3158	11,010.5	$3,476.8	$275	($220)	$3,531.9	$160,480.2		2.50%
25	0.3252	10,955.5	$3,563.2	$274	($219)	$3,618.0	$164,098.2		2.50%

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Beach Administration Building

Design Goal: Provide

18% of average annual electricity

Existing Conditons

Current Average Annual Electrical Usage (kWh)	371,800
Current Utility Price ($/kWh)	$0.1500
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating (Zip Code: 08028)	4.70 kWh/sq-m/day
Solar Capacity Required (kW)	54.8192
Roof Space Needed (sq-ft)	5481.92
Annual Solar kWh (PV Watts)	67,733
Net System installation Cost ($9/kWh)	$493,373
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$593,373**
Materials	$415,361
Labor	$178,012
Engineers Opinion of Probable Cost	$741,716

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	SREC Factor ($/kWh)*	REC Factor
Install									
1	0.1500	67,733.0	$10,160.0	$45,768	($1,355)	$54,573.7	$54,573.7	$0.676	
2	0.1545	67,394.3	$10,412.4	$44,401	($1,348)	$53,465.6	$108,039.3	$0.659	
3	0.1591	67,057.4	$10,671.2	$43,061	($1,341)	$52,391.3	$160,430.6	$0.642	
4	0.1639	66,722.1	$10,936.4	$41,561	($1,334)	$51,162.5	$211,593.1	$0.623	
5	0.1688	66,388.5	$11,208.1	$40,112	($1,328)	$49,992.6	$261,585.7	$0.604	
6	0.1739	66,056.5	$11,486.6	$38,714	($1,321)	$48,879.8	$310,465.6	$0.586	
7	0.1791	65,726.2	$11,772.1	$37,365	($1,315)	$47,822.7	$358,288.3	$0.568	
8	0.1845	65,397.6	$12,064.6	$36,063	($1,308)	$46,819.6	$405,107.9	$0.551	
9	0.1900	65,070.6	$12,364.4	$34,806	($1,301)	$45,869.2	$450,977.1	$0.535	
10	0.1957	64,745.3	$12,671.7	$33,593	($1,295)	$44,969.9	$495,947.0	$0.519	
11	0.2016	64,421.5	$12,986.6	$32,422	($1,288)	$44,120.6	$540,067.6	$0.503	
12	0.2076	64,099.4	$13,309.3	$31,293	($1,282)	$43,319.8	$583,387.4	$0.488	
13	0.2139	63,778.9	$13,640.0	$30,202	($1,276)	$42,566.4	$625,953.9	$0.474	
14	0.2203	63,460.0	$13,979.0	$29,149	($1,269)	$41,859.2	$667,813.1	$0.459	
15	0.2269	63,142.7	$14,326.4	$28,134	($1,263)	$41,197.1	$709,010.2	$0.446	
16	0.2337	62,827.0	$14,682.4	$1,571	($1,257)	$14,996.5	$724,006.7		2.50%
17	0.2407	62,512.9	$15,047.2	$1,563	($1,250)	$15,359.8	$739,366.5		2.50%
18	0.2479	62,200.3	$15,421.2	$1,555	($1,244)	$15,732.2	$755,098.6		2.50%
19	0.2554	61,889.3	$15,804.4	$1,547	($1,238)	$16,113.8	$771,212.4		2.50%
20	0.2630	61,579.9	$16,197.1	$1,539	($1,232)	$16,505.0	$787,717.5		2.50%
21	0.2709	61,272.0	$16,599.6	$1,532	($1,225)	$16,906.0	$804,623.4		2.50%
22	0.2790	60,965.6	$17,012.1	$1,524	($1,219)	$17,316.9	$821,940.3		2.50%
23	0.2874	60,660.8	$17,434.9	$1,517	($1,213)	$17,738.2	$839,678.5		2.50%
24	0.2960	60,357.5	$17,868.1	$1,509	($1,207)	$18,169.9	$857,848.4		2.50%
25	0.3049	60,055.7	$18,312.1	$1,501	($1,201)	$18,612.4	$876,460.8		2.50%

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

APPENDIX F

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 Beach Administration Building			
Street Address 560 Bowe Blvd.		**County**	
City Glassboro		**State** NJ	**Zip** 08028
Facility's Description District Administration Facility			
Total Sq Ft 6,530	**Year Built** 1986	**Hours/Week Occupied** 50	**Number of Employees** 15

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: 12/ / 08 to 12/ / 09

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ELECTRICITY

Electric Utility Name & Account Number(s)	
Atlantic City Electric: 018195799996, 018185399997, 018195399995, 106822499997, 009004799996	
Annual kWh Use 136,512	**Annual Electricity Cost** $20,150
Max Summer kW 1012	**Max Winter kW** 231

NATURAL GAS

Natural Gas Utility Name & Account Number(s)	
South Jersey Energy: 214-3700-1106	
Annual Use in Therms 2,747	**Annual Natural Gas Cost** $3,245

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 Euergy 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 Dorothy Bullock School			
Street Address 370 E. New St.		**County**	
City Glassboro		**State** NJ	**Zip** 08028
Facility's Description Grade 1, 2, 3 School			
Total Sq Ft 87,700	**Year Built** 1993	**Hours/Week Occupied** 82	**Number of Employees** 79

Building Type (Check ouly 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: 12/___/08 to 12/___/09

ELECTRICITY

Electric Utility Name & Account Number(s)	
Atlantic City Electric: 1148-5439-9994	
Annual kWh Use 965,700	**Annual Electricity Cost** $135,975
Max Summer kW 600	**Max Winter kW** 294

NATURAL GAS

Natural Gas Utility Name & Account Number(s)	
South Jersey Energy: 214 35 0028 08	
Annual Use in Therms 52,511	**Annual Natural Gas Cost** $60,155

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.: ____________________

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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 Elsmere School			
Street Address 801 Ellis Mill Rd.		**County**	
City Glassboro		**State** NJ	**Zip** 08028
Facility's Description Special Services Education			
Total Sq Ft 5,358	**Year Built** 1927	**Hours/Week Occupied** 30	**Number of Employees** 2

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: 12/ / 08 to 12/ / 09

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ELECTRICITY

Electric Utility Name & Account Number(s)	
Atlantic City Electric: 0224-0649-9990	
Annual kWh Use 30,920	**Annual Electricity Cost** $4,949
Max Summer kW 13.92	**Max Winter kW** 15.92

NATURAL GAS

Natural Gas Utility Name & Account Number(s)	
South Jersey Energy: 214-43-0080-04	
Annual Use in Therms 4,649	**Annual Natural Gas Cost** $5,446

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)	**Anuual Energy Cost**

STAFF USE ONLY

Date Received: ____________ Project No: ____________

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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 Glassboro High School			
Street Address 550 Bowe Blvd.		**County**	
City Glassboro		**State** NJ	**Zip** 08028
Facility's Description Grade 9-12 School			
Total Sq Ft 113,915	**Year Built** 1966	**Hours/Week Occupied** 85-90	**Number of Employees** 85

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: 1 2/ __ / 0 8 to 1 2/ __ / 0 9

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ELECTRICITY

Electric Utility Name & Account Number(s) Atlantic City Electric: 0181-9549-9993, 1148-5439-9937	
Annual kWh Use 1,563,504	**Annual Electricity Cost** $209,218
Max Summer kW 351	**Max Winter kW** 327

NATURAL GAS

Natural Gas Utility Name & Account Number(s) South Jersey Energy: 214-3700-1007	
Annual Use in Therms 84,089	**Annual Natural Gas Cost** $99,019

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.: ____________

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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 Glassboro Intermediate School			
Street Address 202 N. Delsea Drive		**County**	
City Glassboro		**State** NJ	**Zip** 08028
Facility's Description Grade 7-8 School			
Total Sq Ft 60,671	**Year Built** 1929	**Hours/Week Occupied** 80	**Number of Employees** 58

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: 12/ ___ / 08 to 12/ ___ / 09

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ELECTRICITY

Electric Utility Name & Account Number(s)	
Atlantic City Electric: 3234-5689-9984	
Annual kWh Use 956,100	**Annual Electricity Cost** $135,716
Max Summer kW 399	**Max Winter kW** 636

NATURAL GAS

Natural Gas Utility Name & Account Number(s)	
South Jersey Energy: 2-14-39-00-13-0-2	
Annual Use in Therms 69,159	**Annual Natural Gas Cost** $82,071

FUEL OIL

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

PROPANE

Propane Utility Name & Account Number(s)	
Anuual 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.: ____________

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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 Glassboro Intermediate School Annex			
Street Address 202 N. Delsea Drive		**County**	
City Glassboro		**State** NJ	**Zip** 08028
Facility's Description Grade 7,8: Art, Woodshop, Home Economics Education			
Total Sq Ft 6,270	**Year Built** 1951	**Hours/Week Occupied** 70	**Number of Employees** 4

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: 1 2/____/ 0 8 to 1 2/____/ 0 9

ELECTRICITY

Electric Utility Name & Account Number(s)	
Atlantic City Electric: 0182 3179 9992	
Annual kWh Use 6,530	**Annual Electricity Cost** $1,093
Max Summer kW 7.9	**Max Winter kW** 6.9

NATURAL GAS

Natural Gas Utility Name & Account Number(s)	
South Jersey Energy: 214 3900 0106	
Annual Use in Therms 1,991	**Annual Natural Gas Cost** $2,683

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.: ____________________

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Your Power to Save
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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 J. Harvey Rodgers School			
Street Address 202 N. Delsea Drive		**County**	
City Glassboro		**State** NJ	**Zip** 08028
Facility's Description Pre Kindergarten, Kindergarten School			
Total Sq Ft 39,192	**Year Built** 1957/2000	**Hours/Week Occupied** 75	**Number of Employees** 50

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: 12/___/08 to 12/___/09

ELECTRICITY

Electric Utility Name & Account Number(s)	
Atlantic City Electric: 0222-5479-9954	
Annnal kWh Use 365,680	**Annual Electricity Cost** $51,382
Max Summer kW 148	**Max Wiuter kW** 148

NATURAL GAS

Natural Gas Utility Name & Acconnt Number(s)	
South Jersey Electric: 2153-1022-008	
Annual Use in Therms 25,523	**Annual Natural Gas Cost** $29,175

FUEL OIL

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

PROPANE

Propane Utility Name & Account Number(s)	
Anuual 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.: ______________________

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njcleanenergy.com

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 Thomas E. Bowe			
Street Address 7 Ruth Mancuso Lane		**County**	
City Glassboro		**State** NJ	**Zip** 08028
Facility's Description Grade 4, 5, 6 School			
Total Sq Ft 39,192	**Year Built** 1972	**Hours/Week Occupied** 80	**Number of Employees** 65

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: 12/ / 08 to 12/ / 09

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ELECTRICITY

Electric Utility Name & Account Number(s)	
Atlantic City Electric 1068-2249-9963, 0068-8109-9979	
Annual kWh Use 941,800	**Annual Electricity Cost** $121,883
Max Summer kW 240	**Max Winter kW** 106

NATURAL GAS

Natural Gas Utility Name & Account Number(s)	
South Jersey Energy: 2144-3008-103	
Annual Use in Therms 50,854	**Annual Natural Gas Cost** $59,257

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 G

NJ SMARTSTART INCENTIVES INFORMATION AND WORKSHEETS

New Jersey's Clean Energy PROGRAM™
Your Power to Save
njcleanenergy.com

New Jersey SmartStart BUILDINGS®

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)

				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)

				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 ≤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 ≥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 ≤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 Refridgerated/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<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)	$30

For retrofit of T-8 fixtures by permanent delamping & new reflectors are available only for fixtures with a total Harmonic Distortion of ≤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	**$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 (≥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 (≥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

*Incentives/Requirements subject to change.

NJ SmartStart Buildings®

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 be 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.

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New Jersey SmartStart BUILDINGS®

BPU

2010 Prescriptive Lighting Incentive Worksheet

Customer Information

Company	Facility Address
☐ Check here if multiple worksheets are being submitted for one project/building.	Date Submitted

Prescriptive Lighting Information

For additional fixtures, attach additional sheets and check here ☐

Reason N–New R–Replaced	**Fixture Type Installed**	**Fixture Type Removed**	**Permanent Delamp w/ New Reflector** (Y/N)	**Location** (Bldg/Rm)	**Size of Replaced Lamps in Watts**	**A Incentive Per Fixture** (Table)	**B # of Units**	**Total Incentives (AxB)**
(Examples) R	2x4 3L T-5	2x4 3L T-12	N	Office	40	$15	8	$15 x 8 = $120
R	2x2 2L T-8	2x2 2L T-12	N	Office	34	$15	10	$15 x 10 = $150
R	28w CFL	100w Incan	N	Supply Room	100	$25	3	$25 x 3 = $75
R	250w Pulse Start Metal Halide	400w Mercury Vapor	N	Warehouse	450	$25	3	$25 x 3 = $75
N	New Doors 5' LED	1L T-8 5'	N	Dairy Case #5	38	$42	25	$42 x 25=$1,050
							Total (including additional sheets)	

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 ≤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 ≥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 ≤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 Refridgerated/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<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)	$30

For retrofit of T-8 fixtures by permanent delamping & new reflectors are available only for fixtures with a total Harmonic Distortion of ≤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	**$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 (≥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 (≥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
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Visit our web site: NJCleanEnergy.com/ssb

*Incentives/Requirements subject to change.

NJ SmartStart Buildings®

Program Terms and Conditions

Definitions:

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

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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.

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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 be 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's Clean Energy PROGRAM™ Your Power to Save njcleanenergy.com

New Jersey SmartStart BUILDINGS®

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 / Federal Tax ID#
Street Address	City	State	Zip	Telephone No. ( )	Fax No. ( )

Contractor/Vendor Information (if different from Payee)

Company			Contact Name	Incorporated? ❑ Yes ❑ No	Email Address / 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

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

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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.

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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.

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New Jersey SmartStart BUILDINGS®

New Jersey BPU Board of Public Utilities

2010 Lighting Controls Incentive Worksheet

Customer Information

Company	Facility Address
☐ Check here if multiple worksheets are being submitted for one project/building.	Date Submitted

Lighting Controls Information

For additional fixtures, attach additional sheets and check here ☐

Location	Reason N–New R–Replaced	Control Device Type	Fixture Type Controlled	Watts Controlled per Device	A # of Fixtures Controlled per Device	B # of Units*	C Incentive per Unit	Total Incentive (B x C)
Office 101	(Examples) N	OSW	4-lamp, T8	220	2	4	$20	4 x $20 = $80
Conference Room A	N	OSR	2-lamp, T8	330	6	2	$35	2 x $35 = $70
Large Office 400	N	DLD	2-lamp, T8	275	N/A	6	$50	6 x $50 = $300
Warehouse A	N	OHLF	4-lamp, T8	140	N/A	12	$25	12 x $25 = $300
Warehouse B	N	OSRH	4-lamp, T5	234	1	5	$35	5 x $35 = $175

*For OSW and OSR, insert number of control devices; for DLD and OHLF, insert total number of ballasts controlled; for OHLH and DDH, insert total number of fixtures controlled.

Total (including additional sheets)

001-01/10

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.
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   - DLD will control fixtures that have a ballast factor less than 1.0 for T-5s and 1.14 for T-8s.
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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

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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 be 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: ________________________________ Application Number: ________________
(Corresponding to Rebate Application Form) (Assigned by the NJBPU)

A: EQUIPMENT INFORMATION

1. Solar Electric Module Manufacturer: ____________________ Module Model Number: ____________________
2. Power Rating per Module: ________ DC Watts (Refer to STC conditions) Number of Modules: ____________________
3. Total Array Output: ________ DC Watts (No. of Modules x Power Rating)
4. Inverter Manufacturer: ____________________ Inverter Model Number: ________________
5. Inverter's Continuous AC Rating: ____________________ AC Watts Number of Inverters: ________________
6. Total Inverter Output: ________ AC Watts (Inverter Continuous AC Rating x Number of Inverters)
7. Inverter's Peak Efficiency: ________ (Refer to manufacturer's peak efficiency rating)

B: PROPOSED INSTALLATION/INTERCONNECTION INFORMATION

1. Solar Electric Array Location: _ Rooftop _ Pole Mount or Ground Mount Location:
2. 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.
3. Solar Electric Module Tilt: __________ degrees (e.g., flat mount = 0 degrees; vertical mount = 90 degrees)
4. Solar Electric Module Tracking: _Fixed _Single-axis _Double-axis
5. Inverter Location: _ Indoor _ Outdoor Location: ____
6. Utility-Accessible AC Disconnect Switch Location: ____
7. 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

1. System rated output (Section A, line 3 above): ____________ DC Watts
2. Incentive Calculation (Calculate appropriate incentive based on System Rated Output):

Residential Applicants that perform Energy Efficiency Audit

a. 0 to 10,000 Watts x $1.75/Watt = $__________________+

Residential Applicants that <u>do not</u> perform Energy Efficiency Audit

b. 0 to 10,000 Watts x $1.55/Watt = $__________________+

d. Total Rebate Calculation: $________________________

Commercial, Farm, Public and Non-Profit

0 to 50,000 Watts x $1.00/Watt = $____________________+

<u>Large PV Project Applications</u>

> 50,000 Watts = $____Not eligible for rebates____________

Total Rebate Calculation: $__________________________

3. 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)

4. Total Installed System Cost: $____________________________
   (Eligible installed system cost includes all equipment, installation, and applicable interconnection costs before the New Jersey Clean Energy Program incentive.)

5. **Requested Incentive** (Enter the appropriate value from C2. b or c): $__________________________________

D: WARRANTY INFORMATION

1. Module: _____ Years at _____ Percent of Rated Power Output 2. Inverter:_____ Years 3. 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 Internal Combustion Engines Combustion Turbines	$1.00	30%(1)
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.

New Jersey SmartStart BUILDINGS

WHAT IS DIRECT INSTALL?

Designed for small to medium-sized facilities, Direct Install, by New Jersey's Clean Energy Program, cuts energy costs by replacing eligible lighting, HVAC, motors, natural gas, refrigeration and other equipment with higher efficiency alternatives. The program pays up to 80% of retrofit costs, dramatically lowering your upfront costs and improving your payback on the project. Services are provided by a network of Participating Contractors who perform Energy Assessments to identify eligible alternatives and then install the qualifying measures.

WHO'S ELIGIBLE?

Owners of existing small buildings 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.

WHAT TO EXPECT?

- **The program is completely turnkey!**
  Participating Contractors are approved to perform Energy Assessments and install the energy efficient equipment in your building.
- **Costs to you are minimal!**
  Your share of the project's cost will be approximately 20%, New Jersey's Clean Energy Program pays the remaining 80%. With incentives so dramatic, your payback can be less than 2 years.
- **Turnaround time is quick!**
  Direct Install is designed to fast-track project implementation so your business can begin saving on energy costs sooner rather than later. Participating Contractors will perform the Energy Assessments and implement the recommended efficiency measures quickly.

Contact us today at 866-NJSMART and get started on a path to savings.

New Jersey SmartStart BUILDINGS®

BPU

New Jersey's Clean Energy PROGRAM™ Your Power to Save

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: Glassboro
Estimate by: RNG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	**Glassboro High School** Lighting Upgrades	1	ls.		$ 31,138.00	1	ls.	$ 11,493.00	$ 11,493.00	$ 42,631.00
	Subtotal				31,138.00				11,493.00	

SUBTOTAL =	$ 42,631.00
MARKUP % =	$ 0.15
MARKUP =	$ 6,394.65
SUB-TOTAL w/ OH & P =	$ 49,025.65
CONTINGENCY % =	0.25
CONTINGENCY =	$ 12,256.41
BUDGET COST ESTIMATE =	$ 61,282.06

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	**Glassboro Intermediate School** Lighting Upgrades	1	ls.		$ 6,162.00	1	ls.	$ 3,003.50	$ 3,003.50	$ 9,165.50
	Subtotal				6,162.00				3,003.50	

SUBTOTAL =	$ 9,165.50
MARKUP % =	$ 0.15
MARKUP =	$ 1,374.83
SUB-TOTAL w/ OH & P =	$ 10,540.33
CONTINGENCY % =	0.25
CONTINGENCY =	$ 2,635.08
BUDGET COST ESTIMATE =	$ 13,175.41

CDM

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

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Phone (518) 782-4500
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Location: Glassboro
Estimate by: RNG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Glassboro Intermediate School Annex									
1	Lighting Upgrades	1	ls.		$ 618.00	1	ls.	$ 441.00	$ 441.00	$ 1,059.00
	Subtotal				618.00				441.00	

SUBTOTAL =	$	1,059.00
MARKUP % =	$	0.15
MARKUP =	$	158.85
SUB-TOTAL w/ OH & P =	$	1,217.85
CONTINGENCY % =		0.25
CONTINGENCY =	$	304.46
BUDGET COST ESTIMATE =	$	1,522.31

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Thomas E. Bowe School									
1	Lighting Upgrades	1	ls.		$ 38,084.00	1	ls.	$ 13,461.50	$ 13,461.50	$ 51,545.50
	Subtotal				38,084.00				13,461.50	

SUBTOTAL =	$	51,545.50
MARKUP % =	$	0.15
MARKUP =	$	7,731.83
SUB-TOTAL w/ OH & P =	$	59,277.33
CONTINGENCY % =		0.25
CONTINGENCY =	$	14,819.33
BUDGET COST ESTIMATE =	$	74,096.66

CDM

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ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Glassboro
Estimate by: RNG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Dorothy Bullock School									
1	Lighting Upgrades	1	ls.		$ 24,483.00	1	ls.	$ 9,653.50	$ 9,653.50	$ 34,136.50
	Subtotal				24,483.00				9,653.50	

SUBTOTAL =	$	34,136.50
MARKUP % =	$	0.15
MARKUP =	$	5,120.48
SUB-TOTAL w/ OH & P =	$	39,256.98
CONTINGENCY % =		0.25
CONTINGENCY =	$	9,814.24
BUDGET COST ESTIMATE =	$	49,071.22

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	J. Harvey Rodgers School									
1	Lighting Upgrades	1	ls.		$ 11,740.00	1	ls.	$ 4,688.00	$ 4,688.00	$ 16,428.00
	Subtotal				11,740.00				4,688.00	

SUBTOTAL =	$	16,428.00
MARKUP % =	$	0.15
MARKUP =	$	2,464.20
SUB-TOTAL w/ OH & P =	$	18,892.20
CONTINGENCY % =		0.25
CONTINGENCY =	$	4,723.05
BUDGET COST ESTIMATE =	$	23,615.25

CDM

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ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Glassboro
Estimate by: RNG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Elsmere School									
1	Lighting Upgrades	1	ls.		$ 3,462.00	1	ls.	$ 1,430.00	$ 1,430.00	$ 4,892.00
	Subtotal				3,462.00				1,430.00	

SUBTOTAL =	$ 4,892.00
MARKUP % =	$ 0.15
MARKUP =	$ 733.80
SUB-TOTAL w/ OH & P =	$ 5,625.80
CONTINGENCY % =	0.25
CONTINGENCY =	$ 1,406.45
BUDGET COST ESTIMATE =	$ 7,032.25

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Beach Administration Building									
1	Lighting Upgrades	1	ls.		$ 1,159.00	1	ls.	$ 759.50	$ 759.50	$ 1,918.50
	Subtotal				1,159.00				759.50	

SUBTOTAL =	$ 1,918.50
MARKUP % =	$ 0.15
MARKUP =	$ 287.78
SUB-TOTAL w/ OH & P =	$ 2,206.28
CONTINGENCY % =	0.25
CONTINGENCY =	$ 551.57
BUDGET COST ESTIMATE =	$ 2,757.84

CDM

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ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Glassboro
Estimate by: RNG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Glassboro High School									
1	Solar	1	ls.		$ 4,382,300.00	1	ls.	$ 1,878,128.00	$ 1,878,128.00	$ 6,260,428.00
	Subtotal				4,382,300.00				1,878,128.00	
									SUBTOTAL =	$ 6,260,428.00
									CONTINGENCY % =	0.25
									CONTINGENCY =	$ 1,565,107.00
									BUDGET COST ESTIMATE =	$ 7,825,535.00

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Glassboro Intermediate School									
1	Solar	1	ls.		$ 442,872.00	1	ls.	$ 189,802.00	$ 189,802.00	$ 632,674.00
	Subtotal				442,872.00				189,802.00	
									SUBTOTAL =	$ 632,674.00
									CONTINGENCY % =	0.25
									CONTINGENCY =	$ 158,168.50
									BUDGET COST ESTIMATE =	$ 790,842.50

CDM

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ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Glassboro
Estimate by: RNG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Glassboro Intermediate School Annex									
1	Solar	1	ls.		$ 101,500.00	1	ls.	$ 43,500.00	$ 43,500.00	$ 145,000.00
	Subtotal				101,500.00				43,500.00	

SUBTOTAL =	$	145,000.00
CONTINGENCY % =		0.25
CONTINGENCY =	$	36,250.00
BUDGET COST ESTIMATE =	$	181,250.00

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Thomas E. Bowe School									
1	Solar	1	ls.		$ 3,075,037.00	1	ls.	$ 1,317,873.00	$ 1,317,873.00	$ 4,392,910.00
	Subtotal				3,075,037.00				1,317,873.00	

SUBTOTAL =	$	4,392,910.00
CONTINGENCY % =		0.25
CONTINGENCY =	$	1,098,227.50
BUDGET COST ESTIMATE =	$	5,491,137.50

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Glassboro
Estimate by: RNG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Dorothy Bullock School									
1	Solar	1	ls.		$ 2,825,715.00	1	ls.	$ 1,211,021.00	$ 1,211,021.00	$ 4,036,736.00
	Subtotal				2,825,715.00				1,211,021.00	
									SUBTOTAL =	$ 4,036,736.00
									CONTINGENCY % =	0.25
									CONTINGENCY =	$ 1,009,184.00
									BUDGET COST ESTIMATE =	$ 5,045,920.00

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	J. Harvey Rodgers School									
1	Solar	1	ls.		$ 1,797,662.00	1	ls.	$ 770,426.00	$ 770,426.00	$ 2,568,088.00
	Subtotal				1,797,662.00				770,426.00	
									SUBTOTAL =	$ 2,568,088.00
									CONTINGENCY % =	0.25
									CONTINGENCY =	$ 642,022.00
									BUDGET COST ESTIMATE =	$ 3,210,110.00

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ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

Location: Glassboro
Estimate by: RNG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Elsmere School									
1	Solar	1	ls.		$ 133,000.00	1	ls.	$ 57,000.00	$ 57,000.00	$ 190,000.00
	Subtotal				133,000.00				57,000.00	

SUBTOTAL =	$	190,000.00
CONTINGENCY % =		0.25
CONTINGENCY =	$	47,500.00
BUDGET COST ESTIMATE =	$	237,500.00

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Beach Administration Building									
1	Solar	1	ls.		$ 415,361.00	1	ls.	$ 178,012.00	$ 178,012.00	$ 593,373.00
	Subtotal				415,361.00				178,012.00	

SUBTOTAL =	$	593,373.00
CONTINGENCY % =		0.25
CONTINGENCY =	$	148,343.25
BUDGET COST ESTIMATE =	$	741,716.25

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Glassboro
Estimate by: MJR
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	**Dorothy Bullock School** Boiler, Gas-Fired, Condensing High Efficiency 2,500 MBH	2	ea.	$ 33,500.00	$ 67,000.00	2	ea.	$ 30,000.00	$ 60,000.00	$ 127,000.00
	Subtotal				67,000.00				60,000.00	

*Pricing per boiler manufacturer quote 4/28/2010
**Includes removal and disposal of current boilers, and installation of new boilers
Installation includes gas piping, electrical, modifying hot water supply and return lines

SUBTOTAL =	$ 127,000.00
MARKUP % =	$ 0.15
MARKUP =	$ 19,050.00
SUB-TOTAL w/ OH & P =	$ 146,050.00
CONTINGENCY % =	0.25
CONTINGENCY =	$ 36,512.50
BUDGET COST ESTIMATE =	$ 182,562.50

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Glassboro
Estimate by: MJR
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	**Elsmere School** Boiler, Gas-Fired, Condensing High Efficiency 399 MBH	1	ea.	$ 6,900.00	$ 6,900.00	1	ea.	$ 23,000.00	$ 23,000.00	$ 29,900.00
	Subtotal				6,900.00				23,000.00	

*Pricing per boiler manufacturer quote 4/29/2010

Does not include cost of specialty stack required for condensing boilers

**Includes removal and disposal of current boiler, and installation of new boiler

Installation includes gas piping, electrical, modifying hot water supply and return lines

SUBTOTAL =	$	29,900.00
MARKUP % =	$	0.15
MARKUP =	$	4,485.00
SUB-TOTAL w/ OH & P =	$	34,385.00
CONTINGENCY % =		0.25
CONTINGENCY =	$	8,596.25
BUDGET COST ESTIMATE =	$	42,981.25

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Glassboro
Estimate by: MJR
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	**Glassboro High School** Boiler, Gas-Fired, Condensing High Efficiency 4,500 MBH	2	ea.	$ 34,380.00	$ 68,760.00	2	ea.	$ 33,000.00	$ 66,000.00	$ 134,760.00
	Subtotal				68,760.00				66,000.00	

*Pricing per boiler manufacturer quote 4/29/2010

Does not include cost of specialty stack required for condensing boilers

**Includes removal and disposal of current boiler, and installation of new boiler.

Installation includes gas piping, electrical, modifying hot water supply and return lines

SUBTOTAL =	$	134,760.00
MARKUP % =	$	0.15
MARKUP =	$	20,214.00
SUB-TOTAL w/ OH & P =	$	154,974.00
CONTINGENCY % =		0.25
CONTINGENCY =	$	38,743.50
BUDGET COST ESTIMATE =	$	193,717.50

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Glassboro
Estimate by: MJR
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	**Glassboro Intermediate School** Boiler, Gas-Fired, Condensing High Efficiency 4,000 MBH	3	ea.	$ 32,767.00	$ 98,301.00	3	ea.	$ 24,200.00	$ 72,600.00	$ 170,901.00
	Subtotal				98,301.00				72,600.00	

*Pricing per boiler manufacturer quote 4/29/2010

Does not include cost of specialty stack required for condensing boilers

**Includes removal and disposal of current boiler, and installation of new boiler.

Installation includes gas piping, electrical, modifying hot water supply and return lines

SUBTOTAL =	$ 170,901.00
MARKUP % =	$ 0.15
MARKUP =	$ 25,635.15
SUB-TOTAL w/ OH & P =	$ 196,536.15
CONTINGENCY % =	0.25
CONTINGENCY =	$ 49,134.04
BUDGET COST ESTIMATE =	$ 245,670.19

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

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Location: Glassboro
Estimate by: MJR
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL & LABOR COST	LABOR SUBTOTAL	TOTAL
	Glassboro High School					
1	DDC Control System	113,915	SF	$ 0.40	$ 45,566.00	$ 45,566.00
	Subtotal				45,566.00	

*Pricing per RS Means Costworks 2010

SUBTOTAL =	$ 45,566.00
MARKUP % =	$ 0.15
MARKUP =	$ 6,834.90
SUB-TOTAL w/ OH & P =	$ 52,400.90
CONTINGENCY % =	0.25
CONTINGENCY =	$ 13,100.23
BUDGET COST ESTIMATE =	$ 65,501.13

Notes:
1. DDC Control System Pricing is estimated at $0.40 per square foot
2. One control or sensor point is estimated at $500, thus this system would provide for approximately 131 points

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Glassboro
Estimate by: MJR
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL & LABOR COST	LABOR SUBTOTAL	TOTAL
	Glassboro Intermediate School					
1	DDC Control System	60,671	SF	$ 0.40	$ 24,268.40	$ 24,268.40
	Subtotal				24,268.40	

*Pricing per RS Means Costworks 2010

SUBTOTAL =	$	24,268.40
MARKUP % =	$	0.15
MARKUP =	$	3,640.26
SUB-TOTAL w/ OH & P =	$	27,908.66
CONTINGENCY % =		0.25
CONTINGENCY =	$	6,977.17
BUDGET COST ESTIMATE =	$	34,885.83

Notes:
1. DDC Control System Pricing is estimated at $0.40 per square foot
2. One control or sensor point is estimated at $500, thus this system would provide for approximately 70 points

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Glassboro
Estimate by: MJR
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL & LABOR COST	LABOR SUBTOTAL	TOTAL
	J. Harvey Rodgers School					
1	DDC Control System	39,192	SF	$ 0.40	$ 15,676.80	$ 15,676.80
	Subtotal				15,676.80	

*Pricing per RS Means Costworks 2010

SUBTOTAL =	$	15,676.80
MARKUP % =	$	0.15
MARKUP =	$	2,351.52
SUB-TOTAL w/ OH & P =	$	18,028.32
CONTINGENCY % =		0.25
CONTINGENCY =	$	4,507.08
BUDGET COST ESTIMATE =	$	22,535.40

Notes:
1. DDC Control System Pricing is estimated at $0.40 per square foot
2. One control or sensor point is estimated at $500, thus this system would provide for approximately 45 points

APPENDIX I

ECRM FINANCIAL ANALYSES

ECM	Glassboro High School - Interior & Exterior Lighting	Glassboro Intermediate School School - Interior & Exterior Lighting	Glassboro Intermediate School Annex - Interior Lighting	Thomas E. Bowe School - Interior & Exterior Lighting	Dorothy Bullock School - Interior & Exterior Lighting	J. Harvey Rodgers School - Interior & Exterior Lighting	Elmere School - Interior & Exterior Lighting	Beach Administration Building - Interior & Exterior Lighting
Assumed Inflation (Gas)								
Initial Yearly Savings (Gas)								
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$7,915.00	$3,904.90	$597.80	$8,514.60	$5,765.60	$2,267.50	$391.50	$435.00
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15	15
Lifetime Savings	**$147,210.40**	**$72,626.90**	**$11,118.43**	**$158,362.31**	**$107,233.90**	**$42,173.04**	**$7,281.47**	**$8,090.53**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$7,915.00	$3,904.90	$597.80	$8,514.60	$5,765.60	$2,267.50	$391.50	$435.00
2	$8,152.45	$4,022.05	$615.73	$8,770.04	$5,938.57	$2,335.53	$403.25	$448.05
3	$8,397.02	$4,142.71	$634.21	$9,033.14	$6,116.73	$2,405.59	$415.34	$461.49
4	$8,648.93	$4,266.99	$653.23	$9,304.13	$6,300.23	$2,477.76	$427.80	$475.34
5	$8,908.40	$4,395.00	$672.83	$9,583.26	$6,489.23	$2,552.09	$440.64	$489.60
6	$9,175.65	$4,526.85	$693.01	$9,870.76	$6,683.91	$2,628.65	$453.86	$504.28
7	$9,450.92	$4,662.65	$713.80	$10,166.88	$6,884.43	$2,707.51	$467.47	$519.41
8	$9,734.45	$4,802.53	$735.22	$10,471.88	$7,090.96	$2,788.74	$481.50	$535.00
9	$10,026.49	$4,946.61	$757.28	$10,786.04	$7,303.69	$2,872.40	$495.94	$551.04
10	$10,327.28	$5,095.01	$779.99	$11,109.62	$7,522.80	$2,958.57	$510.82	$567.58
11	$10,637.10	$5,247.86	$803.39	$11,442.91	$7,748.48	$3,047.33	$526.14	$584.60
12	$10,956.21	$5,405.29	$827.50	$11,786.20	$7,980.94	$3,138.75	$541.93	$602.14
13	$11,284.90	$5,567.45	$852.32	$12,139.78	$8,220.37	$3,232.91	$558.19	$620.21
14	$11,623.44	$5,734.48	$877.89	$12,503.98	$8,466.98	$3,329.90	$574.93	$638.81
15	$11,972.15	$5,906.51	$904.23	$12,879.10	$8,720.99	$3,429.80	$592.18	$657.98

ECM	Glassboro High School - Interior Lighting	Glassboro Intermediate School School - Interior Lighting	Thomas E. Bowe School - Interior Lighting	Dorothy Bullock School - Interior Lighting	J. Harvey Rodgers School - Interior Lighting	Elmere School - Interior Lighting	Beach Administration Building Interior Lighting
Assumed Inflation (Gas)							
Initial Yearly Savings (Gas)							
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$4,699.10	$3,672.10	$3,566.20	$4,770.80	$1,562.30	$90.60	$4.20
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15
Lifetime Savings	**$87,398.16**	**$68,297.07**	**$66,327.45**	**$88,731.70**	**$29,057.08**	**$1,685.06**	**$78.12**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$4,699.10	$3,672.10	$3,566.20	$4,770.80	$1,562.30	$90.60	$4.20
2	$4,840.07	$3,782.26	$3,673.19	$4,913.92	$1,609.17	$93.32	$4.33
3	$4,985.28	$3,895.73	$3,783.38	$5,061.34	$1,657.44	$96.12	$4.46
4	$5,134.83	$4,012.60	$3,896.88	$5,213.18	$1,707.17	$99.00	$4.59
5	$5,288.88	$4,132.98	$4,013.79	$5,369.58	$1,758.38	$101.97	$4.73
6	$5,447.54	$4,256.97	$4,134.20	$5,530.66	$1,811.13	$105.03	$4.87
7	$5,610.97	$4,384.68	$4,258.23	$5,696.58	$1,865.47	$108.18	$5.02
8	$5,779.30	$4,516.22	$4,385.98	$5,867.48	$1,921.43	$111.43	$5.17
9	$5,952.68	$4,651.71	$4,517.56	$6,043.51	$1,979.07	$114.77	$5.32
10	$6,131.26	$4,791.26	$4,653.08	$6,224.81	$2,038.45	$118.21	$5.48
11	$6,315.20	$4,935.00	$4,792.67	$6,411.56	$2,099.60	$121.76	$5.64
12	$6,504.65	$5,083.05	$4,936.45	$6,603.90	$2,162.59	$125.41	$5.81
13	$6,699.79	$5,235.54	$5,084.55	$6,802.02	$2,227.47	$129.17	$5.99
14	$6,900.79	$5,392.60	$5,237.08	$7,006.08	$2,294.29	$133.05	$6.17
15	$7,107.81	$5,554.38	$5,394.20	$7,216.26	$2,363.12	$137.04	$6.35

ECM	Glassboro High School - Exterior Lighting	Glassboro Intermediate School School - Exterior Lighting	Thomas E. Bowe School - Exterior Lighting	Dorothy Bullock School - Exterior Lighting	J. Harvey Rodgers School - Exterior Lighting	Elmere School - Exterior Lighting	Beach Administration Building Exterior Lighting
Assumed Inflation (Gas)							
Initial Yearly Savings (Gas)							
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$3,215.90	$232.70	$4,948.40	$994.80	$705.20	$300.90	$430.80
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15
Lifetime Savings	**$59,812.25**	**$4,327.97**	**$92,034.87**	**$18,502.20**	**$13,115.95**	**$5,596.41**	**$8,012.41**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$3,215.90	$232.70	$4,948.40	$994.80	$705.20	$300.90	$430.80
2	$3,312.38	$239.68	$5,096.85	$1,024.64	$726.36	$309.93	$443.72
3	$3,411.75	$246.87	$5,249.76	$1,055.38	$748.15	$319.22	$457.04
4	$3,514.10	$254.28	$5,407.25	$1,087.04	$770.59	$328.80	$470.75
5	$3,619.52	$261.91	$5,569.47	$1,119.66	$793.71	$338.67	$484.87
6	$3,728.11	$269.76	$5,736.55	$1,153.25	$817.52	$348.83	$499.42
7	$3,839.95	$277.86	$5,908.65	$1,187.84	$842.05	$359.29	$514.40
8	$3,955.15	$286.19	$6,085.91	$1,223.48	$867.31	$370.07	$529.83
9	$4,073.81	$294.78	$6,268.49	$1,260.18	$893.33	$381.17	$545.72
10	$4,196.02	$303.62	$6,456.54	$1,297.99	$920.13	$392.61	$562.10
11	$4,321.90	$312.73	$6,650.24	$1,336.93	$947.73	$404.38	$578.96
12	$4,451.56	$322.11	$6,849.74	$1,377.04	$976.16	$416.52	$596.33
13	$4,585.10	$331.77	$7,055.24	$1,418.35	$1,005.45	$429.01	$614.22
14	$4,722.66	$341.73	$7,266.89	$1,460.90	$1,035.61	$441.88	$632.64
15	$4,864.34	$351.98	$7,484.90	$1,504.72	$1,066.68	$455.14	$651.62

ECM	Glassboro Wind Turbine System - Minimum Wind Speed	Glassboro Wind Turbine System - Maximum Wind Speed	Glassboro Wind Turbine System - Average Wind Speed
Assumed Inflation (Gas)			
Initial Yearly Savings (Gas)			
Assumed Inflation (Electricity)	3%	3%	3%
Initial Yearly Savings (Electricity)	$584.70	$1,342.90	$1,034.60
Assumed Average Useful Life (Years)	25	25	25
Lifetime Savings	**$21,660.07**	**$49,747.41**	**$38,326.51**
Year	Annual Savings	Annual Savings	Annual Savings
1	$584.70	$1,342.90	$1,034.60
2	$602.24	$1,383.19	$1,065.64
3	$620.31	$1,424.68	$1,097.61
4	$638.92	$1,467.42	$1,130.54
5	$658.09	$1,511.45	$1,164.45
6	$677.83	$1,556.79	$1,199.38
7	$698.16	$1,603.49	$1,235.37
8	$719.11	$1,651.60	$1,272.43
9	$740.68	$1,701.15	$1,310.60
10	$762.90	$1,752.18	$1,349.92
11	$785.79	$1,804.75	$1,390.42
12	$809.36	$1,858.89	$1,432.13
13	$833.64	$1,914.65	$1,475.09
14	$858.65	$1,972.09	$1,519.34
15	$884.41	$2,031.26	$1,564.93
16	$910.94	$2,092.19	$1,611.87
17	$938.27	$2,154.96	$1,660.23
18	$966.42	$2,219.61	$1,710.04
29	$1,337.75	$3,072.46	$2,367.09
20	$1,025.27	$2,354.78	$1,814.18
21	$1,056.03	$2,425.43	$1,868.60
22	$1,087.71	$2,498.19	$1,924.66
23	$1,120.35	$2,573.14	$1,982.40
24	$1,153.96	$2,650.33	$2,041.87
25	$1,188.57	$2,729.84	$2,103.13

ECM	Glassboro High School - Solar	Glassboro Intermediate School School - Solar	Glassboro Intermediate School Annex - Solar	Thomas E. Bowe School - Solar	Dorothy Bullock School - Solar	J. Harvey Rodgers School - Solar	Elmere School - Solar	Beach Administration Building - Solar
Assumed Inflation (Gas)								
Initial Yearly Savings (Gas)								
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$109,945.60	$10,237.90	$1,050.30	$82,509.40	$81,068.30	$50,824.80	$1,977.00	$10,160.00
Assumed Average Useful Life (Years)	25	25	25	25	25	25	25	25
Lifetime Savings	**$4,072,908.25**	**$379,260.54**	**$38,908.11**	**$3,056,540.83**	**$3,003,155.63**	**$1,882,792.46**	**$73,237.49**	**$376,374.75**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$109,945.60	$10,237.90	$1,050.30	$82,509.40	$81,068.30	$50,824.80	$1,977.00	$10,160.00
2	$113,243.97	$10,545.04	$1,081.81	$84,984.68	$83,500.35	$52,349.54	$2,036.31	$10,464.80
3	$116,641.29	$10,861.39	$1,114.26	$87,534.22	$86,005.36	$53,920.03	$2,097.40	$10,778.74
4	$120,140.53	$11,187.23	$1,147.69	$90,160.25	$88,585.52	$55,537.63	$2,160.32	$11,102.11
5	$123,744.74	$11,522.85	$1,182.12	$92,865.06	$91,243.09	$57,203.76	$2,225.13	$11,435.17
6	$127,457.08	$11,868.53	$1,217.59	$95,651.01	$93,980.38	$58,919.87	$2,291.88	$11,778.22
7	$131,280.80	$12,224.59	$1,254.11	$98,520.54	$96,799.79	$60,687.47	$2,360.64	$12,131.57
8	$135,219.22	$12,591.33	$1,291.74	$101,476.15	$99,703.78	$62,508.09	$2,431.46	$12,495.52
9	$139,275.80	$12,969.07	$1,330.49	$104,520.44	$102,694.90	$64,383.34	$2,504.40	$12,870.38
10	$143,454.07	$13,358.14	$1,370.40	$107,656.05	$105,775.74	$66,314.84	$2,579.54	$13,256.50
11	$147,757.69	$13,758.88	$1,411.52	$110,885.73	$108,949.02	$68,304.28	$2,656.92	$13,654.19
12	$152,190.42	$14,171.65	$1,453.86	$114,212.31	$112,217.49	$70,353.41	$2,736.63	$14,063.82
13	$156,756.14	$14,596.80	$1,497.48	$117,638.68	$115,584.01	$72,464.01	$2,818.73	$14,485.73
14	$161,458.82	$15,034.70	$1,542.40	$121,167.84	$119,051.53	$74,637.93	$2,903.29	$14,920.30
15	$166,302.58	$15,485.74	$1,588.67	$124,802.87	$122,623.08	$76,877.07	$2,990.39	$15,367.91
16	$171,291.66	$15,950.31	$1,636.33	$128,546.96	$126,301.77	$79,183.38	$3,080.10	$15,828.95
17	$176,430.41	$16,428.82	$1,685.42	$132,403.37	$130,090.82	$81,558.88	$3,172.50	$16,303.82
18	$181,723.32	$16,921.69	$1,735.99	$136,375.47	$133,993.55	$84,005.65	$3,267.68	$16,792.93
29	$251,547.58	$23,423.57	$2,403.01	$188,775.54	$185,478.41	$116,283.47	$4,523.23	$23,245.35
20	$192,790.28	$17,952.22	$1,841.71	$144,680.73	$142,153.75	$89,121.59	$3,466.68	$17,815.62
21	$198,573.98	$18,490.79	$1,896.96	$149,021.15	$146,418.37	$91,795.24	$3,570.68	$18,350.09
22	$204,531.20	$19,045.51	$1,953.87	$153,491.79	$150,810.92	$94,549.10	$3,677.80	$18,900.59
23	$210,667.14	$19,616.88	$2,012.48	$158,096.54	$155,335.25	$97,385.57	$3,788.14	$19,467.61
24	$216,987.15	$20,205.38	$2,072.86	$162,839.44	$159,995.30	$100,307.14	$3,901.78	$20,051.64
25	$223,496.77	$20,811.54	$2,135.04	$167,724.62	$164,795.16	$103,316.35	$4,018.83	$20,653.19

ECM	Glassboro High School - Computer Power Management Software	Glassboro Intermediate School School - Computer Power Management Software	Thomas E. Bowe School - Computer Power Management Software	Dorothy Bullock School - Computer Power Management Software	J. Harvey Rodgers School - Computer Power Management Software	Beach Administration Building - Computer Power Management Software
Assumed Inflation (Gas)						
Initial Yearly Savings (Gas)						
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$3,638.80	$2,004.20	$3,111.10	$2,019.20	$1,666.60	$416.70
Assumed Average Useful Life (Years)	25	25	25	25	25	25
Lifetime Savings	**$19,318.88**	**$10,640.57**	**$16,517.25**	**$10,720.21**	**$8,848.21**	**$2,212.32**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$3,638.80	$2,004.20	$3,111.10	$2,019.20	$1,666.60	$416.70
2	$3,747.96	$2,064.33	$3,204.43	$2,079.78	$1,716.60	$429.20
3	$3,860.40	$2,126.26	$3,300.57	$2,142.17	$1,768.10	$442.08
4	$3,976.22	$2,190.04	$3,399.58	$2,206.43	$1,821.14	$455.34
5	$4,095.50	$2,255.74	$3,501.57	$2,272.63	$1,875.77	$469.00

ECM	Dorothy Bullock School - Boiler Upgrade	Elsmere School - Boiler Upgrade	Glassboro High School - Boiler Upgrade	Glassboro Intermediate School - Boiler Upgrade	Glassboro High School - Building Management System	Glassboro Intermediate School - Building Management System	J. Harvey Rodgers School - Building Management System
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)	$18,513.00	$1,629.00	$24,822.00	$29,144.00	$10,734.00	$9,251.00	$3,320.00
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)					$9,285.00	$8,014.00	$1,545.00
Assumed Average Useful Life (Years)	24	24	24	24	15	15	15
Lifetime Savings	**$563,199.94**	**$49,557.21**	**$755,131.47**	**$886,614.76**	**$358,318.45**	**$309,033.10**	**$86,149.47**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$18,513.00	$1,629.00	$24,822.00	$29,144.00	$20,019.00	$17,265.00	$4,865.00
2	$18,883.26	$1,661.58	$25,318.44	$29,726.88	$20,512.23	$17,690.44	$4,977.75
3	$19,260.93	$1,694.81	$25,824.81	$30,321.42	$21,018.11	$18,126.79	$5,093.22
4	$19,646.14	$1,728.71	$26,341.30	$30,927.85	$21,536.98	$18,574.35	$5,211.47
5	$20,039.07	$1,763.28	$26,868.13	$31,546.40	$22,069.18	$19,033.41	$5,332.59
6	$20,439.85	$1,798.55	$27,405.49	$32,177.33	$22,615.06	$19,504.27	$5,456.63
7	$20,848.64	$1,834.52	$27,953.60	$32,820.88	$23,175.00	$19,987.26	$5,583.67
8	$21,265.62	$1,871.21	$28,512.68	$33,477.30	$23,749.37	$20,482.70	$5,713.79
9	$21,690.93	$1,908.63	$29,082.93	$34,146.84	$24,338.55	$20,990.92	$5,847.07
10	$22,124.75	$1,946.81	$29,664.59	$34,829.78	$24,942.94	$21,512.25	$5,983.58
11	$22,567.24	$1,985.74	$30,257.88	$35,526.37	$25,562.95	$22,047.06	$6,123.41
12	$23,018.59	$2,025.46	$30,863.04	$36,236.90	$26,198.99	$22,595.71	$6,266.64
13	$23,478.96	$2,065.97	$31,480.30	$36,961.64	$26,851.50	$23,158.55	$6,413.36
14	$23,948.54	$2,107.29	$32,109.90	$37,700.87	$27,520.91	$23,735.98	$6,563.66
15	$24,427.51	$2,149.43	$32,752.10	$38,454.89	$28,207.68	$24,328.39	$6,717.62
16	$24,916.06	$2,192.42	$33,407.14	$39,223.99			
17	$25,414.38	$2,236.27	$34,075.29	$40,008.47			
18	$25,922.67	$2,280.99	$34,756.79	$40,808.64			
19	$26,441.12	$2,326.61	$35,451.93	$41,624.81			
20	$26,969.95	$2,373.15	$36,160.97	$42,457.30			
21	$27,509.34	$2,420.61	$36,884.19	$43,306.45			
22	$28,059.53	$2,469.02	$37,621.87	$44,172.58			
23	$28,620.72	$2,518.40	$38,374.31	$45,056.03			
24	$29,193.14	$2,568.77	$39,141.79	$45,957.15			

IRR, NPV, AROI

Inflation Rate: **3%**

Lighting Upgrades - Interior & Exterior		**Lighting Upgrades - Interior & Exterior**		**Lighting Upgrades - Interior**		**Lighting Upgrades - Interior & Exterior**		**Lighting Upgrades - Interior & Exterior**		**Lighting Upgrades - Interior & Exterior**		**Lighting Upgrades - Interior & Exterior**		**Lighting Upgrades - Interior & Exterior**	
Glassboro High School		**Glassboro Intermediate School**		**Glassboro Intermediate School Annex**		**Thomas E. Bowe School**		**Dorothy Bullock School**		**J. Harvey Rodgers School**		**Elsmere School**		**Beach Administration Building**	
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**	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	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	**($55,172.10)**	0	**($12,510.40)**	0	**($1,268.60)**	0	**($69,181.70)**	0	**($44,336.20)**	0	**($21,835.30)**	0	**($7,032.30)**	0	**($2,637.80)**
1	**$8,178.38**	1	**$4,026.45**	1	**$597.80**	1	**$8,675.05**	1	**$5,927.22**	1	**$2,537.60**	1	**$445.81**	1	**$671.88**
2	$8,423.73	2	$4,147.24	2	$615.73	2	$8,935.30	2	$6,105.04	2	$2,613.73	2	$459.18	2	$692.04
3	$8,676.44	3	$4,271.66	3	$634.21	3	$9,203.36	3	$6,288.19	3	$2,692.14	3	$472.96	3	$712.80
4	$8,936.74	4	$4,399.81	4	$653.23	4	$9,479.46	4	$6,476.83	4	$2,772.90	4	$487.15	4	$734.18
5	$9,204.84	5	$4,531.80	5	$672.83	5	$9,763.85	5	$6,671.14	5	$2,856.09	5	$501.76	5	$756.21
6	$9,480.98	6	$4,667.76	6	$693.01	6	$10,056.76	6	$6,871.27	6	$2,941.77	6	$516.82	6	$778.89
7	$9,765.41	7	$4,807.79	7	$713.80	7	$10,358.46	7	$7,077.41	7	$3,030.03	7	$532.32	7	$802.26
8	$10,058.38	8	$4,952.03	8	$735.22	8	$10,669.22	8	$7,289.73	8	$3,120.93	8	$548.29	8	$826.33
9	$10,360.13	9	$5,100.59	9	$757.28	9	$10,989.29	9	$7,508.42	9	$3,214.56	9	$564.74	9	$851.12
10	$10,670.93	10	$5,253.60	10	$779.99	10	$11,318.97	10	$7,733.68	10	$3,310.99	10	$581.68	10	$876.65
11	$10,991.06	11	$5,411.21	11	$803.39	11	$11,658.54	11	$7,965.69	11	$3,410.32	11	$599.13	11	$902.95
12	$11,320.79	12	$5,573.55	12	$827.50	12	$12,008.30	12	$8,204.66	12	$3,512.63	12	$617.11	12	$930.04
13	$11,660.41	13	$5,740.75	13	$852.32	13	$12,368.55	13	$8,450.80	13	$3,618.01	13	$635.62	13	$957.94
14	$12,010.23	14	$5,912.98	14	$877.89	14	$12,739.60	14	$8,704.32	14	$3,726.55	14	$654.69	14	$986.68
15	$12,370.53	15	$6,090.37	15	$904.23	15	$13,121.79	15	$8,965.45	15	$3,838.35	15	$674.33	15	$1,016.28
IRR	14.98%	IRR	34.60%	IRR	49.95%	IRR	11.94%	IRR	13.07%	IRR	10.66%	IRR	1.99%	IRR	27.42%
NPV	$63,930.52	NPV	$46,127.22	NPV	$7,437.23	NPV	$57,153.98	NPV	$41,982.54	NPV	$15,120.04	NPV	($539.92)	NPV	$7,146.86
AROI	8.16%	AROI	25.52%	AROI	40.46%	AROI	5.87%	AROI	6.70%	AROI	4.95%	AROI	-0.33%	AROI	18.80%

Lighting Upgrades - Interior		**Lighting Upgrades - Interior**		**Lighting Upgrades - Interior**		**Lighting Upgrades - Interior**		**Lighting Upgrades - Interior**		**Lighting Upgrades - Interior**		**Lighting Upgrades - Interior**	
Glassboro High School		**Glassboro Intermediate School**		**Thomas E. Bowe School**		**Dorothy Bullock School**		**J. Harvey Rodgers School**		**Elsmere School**		**Beach Administration Building**	
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**	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	Year	Cash Flow	Year	Cash Flow
0	**($23,487.30)**	0	**($4,335.30)**	0	**($16,363.90)**	0	**($22,040.60)**	0	**($6,971.50)**	0	**($1,086.80)**	0	**($792.10)**
1	**$4,934.16**	1	**$3,789.63**	1	**$3,686.74**	1	**$4,921.47**	1	**$1,806.85**	1	**$137.61**	1	**$5.29**
2	$5,082.18	2	$3,903.32	2	$3,797.34	2	$5,069.11	2	$1,861.06	2	$141.74	2	$5.45
3	$5,234.65	3	$4,020.42	3	$3,911.26	3	$5,221.19	3	$1,916.89	3	$145.99	3	$5.61
4	$5,391.69	4	$4,141.03	4	$4,028.60	4	$5,377.82	4	$1,974.39	4	$150.37	4	$5.78
5	$5,553.44	5	$4,265.26	5	$4,149.46	5	$5,539.16	5	$2,033.63	5	$154.88	5	$5.95
6	$5,720.04	6	$4,393.22	6	$4,273.94	6	$5,705.33	6	$2,094.63	6	$159.53	6	$6.13
7	$5,891.65	7	$4,525.02	7	$4,402.16	7	$5,876.49	7	$2,157.47	7	$164.31	7	$6.32
8	$6,068.39	8	$4,660.77	8	$4,534.23	8	$6,052.79	8	$2,222.20	8	$169.24	8	$6.51
9	$6,250.45	9	$4,800.59	9	$4,670.25	9	$6,234.37	9	$2,288.86	9	$174.32	9	$6.70
10	$6,437.96	10	$4,944.61	10	$4,810.36	10	$6,421.40	10	$2,357.53	10	$179.55	10	$6.90
11	$6,631.10	11	$5,092.95	11	$4,954.67	11	$6,614.04	11	$2,428.26	11	$184.94	11	$7.11
12	$6,830.03	12	$5,245.73	12	$5,103.31	12	$6,812.47	12	$2,501.10	12	$190.48	12	$7.32
13	$7,034.93	13	$5,403.11	13	$5,256.41	13	$7,016.84	13	$2,576.14	13	$196.20	13	$7.54
14	$7,245.98	14	$5,565.20	14	$5,414.10	14	$7,227.34	14	$2,653.42	14	$202.08	14	$7.77
15	$7,463.36	15	$5,732.16	15	$5,576.53	15	$7,444.16	15	$2,733.02	15	$208.15	15	$8.00
IRR	22.44%	IRR	90.40%	IRR	24.16%	IRR	23.94%	IRR	27.91%	IRR	12.11%	IRR	#DIV/0!
NPV	$48,369.40	NPV	$50,853.49	NPV	$37,326.49	NPV	$49,631.29	NPV	$19,341.85	NPV	$917.23	NPV	($715.06)
AROI	14.34%	AROI	80.75%	AROI	15.86%	AROI	15.66%	AROI	19.25%	AROI	6.00%	AROI	-6.00%

Lighting Upgrades - Exterior		**Lighting Upgrades - Exterior**		**Lighting Upgrades - Exterior**		**Lighting Upgrades - Exterior**		**Lighting Upgrades - Exterior**		**Lighting Upgrades - Exterior**		**Lighting Upgrades - Exterior**	
Glassboro High School		**Glassboro Intermediate School**		**Thomas E. Bowe School**		**Dorothy Bullock School**		**J. Harvey Rodgers School**		**Elsmere School**		**Beach Administration Building**	
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**	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	Year	Cash Flow	Year	Cash Flow
0	**($31,684.80)**	0	**($8,175.10)**	0	**($52,817.80)**	0	**($22,295.60)**	0	**($14,863.80)**	0	**($5,945.50)**	0	**($1,845.80)**
1	**$3,244.22**	1	**$236.72**	1	**$4,988.32**	1	**$1,005.75**	1	**$730.75**	1	**$308.20**	1	**$666.59**
2	$3,341.55	2	$243.82	2	$5,137.97	2	$1,035.92	2	$752.67	2	$317.45	2	$686.59
3	$3,441.79	3	$251.14	3	$5,292.11	3	$1,067.00	3	$775.25	3	$326.97	3	$707.19
4	$3,545.05	4	$258.67	4	$5,450.87	4	$1,099.01	4	$798.51	4	$336.78	4	$728.40
5	$3,651.40	5	$266.43	5	$5,614.40	5	$1,131.98	5	$822.47	5	$346.88	5	$750.25
6	$3,760.94	6	$274.42	6	$5,782.83	6	$1,165.94	6	$847.14	6	$357.29	6	$772.76
7	$3,873.77	7	$282.66	7	$5,956.31	7	$1,200.92	7	$872.55	7	$368.01	7	$795.94
8	$3,989.98	8	$291.14	8	$6,135.00	8	$1,236.95	8	$898.73	8	$379.05	8	$819.82
9	$4,109.68	9	$299.87	9	$6,319.05	9	$1,274.05	9	$925.69	9	$390.42	9	$844.42
10	$4,232.97	10	$308.87	10	$6,508.63	10	$1,312.28	10	$953.46	10	$402.13	10	$869.75
11	$4,359.96	11	$318.13	11	$6,703.88	11	$1,351.64	11	$982.07	11	$414.20	11	$895.84
12	$4,490.76	12	$327.68	12	$6,905.00	12	$1,392.19	12	$1,011.53	12	$426.62	12	$922.72
13	$4,625.48	13	$337.51	13	$7,112.15	13	$1,433.96	13	$1,041.87	13	$439.42	13	$950.40
14	$4,764.25	14	$347.63	14	$7,325.52	14	$1,476.98	14	$1,073.13	14	$452.60	14	$978.91
15	$4,907.17	15	$358.06	15	$7,545.28	15	$1,521.29	15	$1,105.32	15	$466.18	15	$1,008.28
IRR	8.63%	IRR	-6.53%	IRR	7.41%	IRR	-1.99%	IRR	-1.03%	IRR	-0.42%	IRR	38.70%
NPV	$15,561.12	NPV	($4,727.72)	NPV	$19,827.64	NPV	($7,648.76)	NPV	($4,221.81)	NPV	($1,457.15)	NPV	$7,861.82
AROI	3.57%	AROI	-3.77%	AROI	2.78%	AROI	-2.16%	AROI	-1.75%	AROI	-1.48%	AROI	29.45%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of:	3%
O&M inflation:	3%

Glassboro High School - PV Solar System

Year	Energy Savings	SREC Sales	Cash Flow
0			($7,825,535)
1	$109,945.6	$571,478	$681,424
2	$112,677.7	$554,405	$667,083
3	$115,477.7	$537,677	$653,155
4	$118,347.4	$518,939	$637,286
5	$121,288.3	$500,854	$622,142
6	$124,302.3	$483,399	$607,701
7	$127,391.2	$466,553	$593,944
8	$130,556.9	$450,293	$580,850
9	$133,801.2	$434,600	$568,402
10	$137,126.2	$419,455	$556,581
11	$140,533.8	$404,837	$545,370
12	$144,026.0	$390,728	$534,754
13	$147,605.1	$377,111	$524,716
14	$151,273.1	$363,969	$515,242
15	$155,032.2	$351,285	$506,317
16	$158,884.8	$19,612	$178,497
17	$162,833.0	$19,514	$182,347
18	$166,879.4	$19,416	$186,296
19	$171,026.4	$19,319	$190,346
20	$175,276.4	$19,223	$194,499
21	$179,632.0	$19,127	$198,759
22	$184,095.9	$19,031	$203,127
23	$188,670.7	$18,936	$207,606
24	$193,359.1	$18,841	$212,200
25	$198,164.1	$18,747	$216,911
		IRR	3.49%
		NPV	$330,863.60
		AROI	4.71%

Glassboro Intermediate School - PV Solar System

Year	Energy Savings	SREC Sales	Cash Flow
0			($790,843)
1	$10,237.9	$49,414	$59,652
2	$10,492.3	$47,938	$58,430
3	$10,753.1	$46,491	$57,244
4	$11,020.3	$44,871	$55,891
5	$11,294.1	$43,307	$54,601
6	$11,574.8	$41,798	$53,373
7	$11,862.4	$40,341	$52,204
8	$12,157.2	$38,935	$51,093
9	$12,459.3	$37,579	$50,038
10	$12,768.9	$36,269	$49,038
11	$13,086.2	$35,005	$48,091
12	$13,411.4	$33,785	$47,196
13	$13,744.7	$32,608	$46,352
14	$14,086.3	$31,471	$45,557
15	$14,436.3	$30,374	$44,811
16	$14,795.0	1,696	$16,491
17	$15,162.7	1,687	$16,850
18	$15,539.5	1,679	$17,218
19	$15,925.7	1,670	$17,596
20	$16,321.4	1,662	$17,984
21	$16,727.0	1,654	$18,381
22	$17,142.7	1,646	$18,788
23	$17,568.7	1,637	$19,206
24	$18,005.2	1,629	$19,634
25	$18,452.7	1,621	$20,074
		IRR	1.97%
		NPV	($68,861.04)
		AROI	3.54%

Glassboro Intermediate School Annex - PV Solar System

Year	Energy Savings	SREC Sales	Cash Flow
0			($181,250)
1	$1,050.3	$4,175	$5,225
2	$1,076.4	$4,050	$5,126
3	$1,103.1	$3,928	$5,031
4	$1,130.5	$3,791	$4,921
5	$1,158.6	$3,659	$4,817
6	$1,187.4	$3,531	$4,719
7	$1,216.9	$3,408	$4,625
8	$1,247.2	$3,289	$4,536
9	$1,278.1	$3,175	$4,453
10	$1,309.9	$3,064	$4,374
11	$1,342.5	$2,957	$4,300
12	$1,375.8	$2,854	$4,230
13	$1,410.0	$2,755	$4,165
14	$1,445.0	$2,659	$4,104
15	$1,481.0	$2,566	$4,047
16	$1,517.8	$143	$1,661
17	$1,555.5	$143	$1,698
18	$1,594.1	$142	$1,736
19	$1,633.7	$141	$1,775
20	$1,674.3	$140	$1,815
21	$1,715.9	$140	$1,856
22	$1,758.6	$139	$1,898
23	$1,802.3	$138	$1,941
24	$1,847.1	$138	$1,985
25	$1,893.0	$137	$2,030
		IRR	N/A
		NPV	($116,016.82)
		AROI	-1.12%

Thomas E. Bowe School - PV Solar System

Year	Energy Savings	SREC Sales	Cash Flow
0			($5,491,138)
1	$82,509.4	$398,236	$480,746
2	$84,559.8	$386,339	$470,899
3	$86,661.1	$374,682	$461,343
4	$88,814.6	$361,624	$450,439
5	$91,021.7	$349,021	$440,043
6	$93,283.5	$336,858	$430,142
7	$95,601.6	$325,119	$420,720
8	$97,977.3	$313,788	$411,766
9	$100,412.1	$302,853	$403,265
10	$102,907.3	$292,298	$395,206
11	$105,464.6	$282,112	$387,576
12	$108,085.4	$272,280	$380,365
13	$110,771.3	$262,791	$373,562
14	$113,524.0	$253,633	$367,157
15	$116,345.0	$244,794	$361,139
16	$119,236.2	$13,667	$132,903
17	$122,199.2	$13,598	$135,798
18	$125,235.9	$13,530	$138,766
19	$128,348.0	$13,463	$141,811
20	$131,537.4	$13,395	$144,933
21	$134,806.1	$13,328	$148,135
22	$138,156.1	$13,262	$151,418
23	$141,589.2	$13,195	$154,785
24	$145,107.7	$13,129	$158,237
25	$148,713.7	$13,064	$161,777
		IRR	3.68%
		NPV	$327,457.29
		AROI	4.75%

Dorothy Bullock School - PV Solar System

Year	Energy Savings	SREC Sales	Cash Flow
0			($5,045,919)
1	$81,068.3	$365,195	$446,263
2	$83,082.8	$354,285	$437,368
3	$85,147.4	$343,595	$428,742
4	$87,263.3	$331,620	$418,884
5	$89,431.8	$320,063	$409,495
6	$91,654.2	$308,909	$400,563
7	$93,931.8	$298,144	$392,076
8	$96,266.0	$287,753	$384,019
9	$98,658.2	$277,725	$376,383
10	$101,109.9	$268,047	$369,156
11	$103,622.4	$258,705	$362,328
12	$106,197.5	$249,689	$355,887
13	$108,836.5	$240,988	$349,824
14	$111,541.1	$232,589	$344,130
15	$114,312.9	$224,483	$338,796
16	$117,153.5	$12,533	$129,686
17	$120,064.8	$12,470	$132,535
18	$123,048.4	$12,408	$135,456
19	$126,106.2	$12,346	$138,452
20	$129,239.9	$12,284	$141,524
21	$132,451.5	$12,223	$144,674
22	$135,742.9	$12,161	$147,904
23	$139,116.1	$12,101	$151,217
24	$142,573.2	$12,040	$154,613
25	$146,116.1	$11,980	$158,096
		IRR	3.92%
		NPV	$413,514.82
		AROI	4.84%

J. Harvey Rodgers School - PV Solar System

Year	Energy Savings	SREC Sales	Cash Flow
0			($3,210,110)
1	$50,824.8	$228,955	$279,780
2	$52,087.8	$222,115	$274,203
3	$53,382.2	$215,413	$268,795
4	$54,708.7	$207,906	$262,614
5	$56,068.2	$200,660	$256,728
6	$57,461.5	$193,667	$251,129
7	$58,889.5	$186,918	$245,807
8	$60,352.9	$180,404	$240,757
9	$61,852.6	$174,117	$235,969
10	$63,389.7	$168,049	$231,438
11	$64,964.9	$162,192	$227,157
12	$66,579.3	$156,540	$223,119
13	$68,233.8	$151,084	$219,318
14	$69,929.4	$145,819	$215,748
15	$71,667.1	$140,737	$212,404
16	$73,448.0	$7,857	$81,305
17	$75,273.2	$7,818	$83,091
18	$77,143.8	$7,779	$84,923
19	$79,060.8	$7,740	$86,801
20	$81,025.5	$7,701	$88,727
21	$83,038.9	$7,663	$90,702
22	$85,102.5	$7,624	$92,727
23	$87,217.3	$7,586	$94,804
24	$89,384.6	$7,548	$96,933
25	$91,605.8	$7,511	$99,116
		IRR	3.75%
		NPV	$212,618.77
		AROI	4.72%

Elsmere School - PV Solar System

Year	Energy Savings	SREC Sales	Cash Flow
0			($237,500)
1	$1,977.0	$8,349	$10,326
2	$2,026.1	$8,100	$10,126
3	$2,076.4	$7,855	$9,932
4	$2,128.0	$7,582	$9,710
5	$2,180.9	$7,317	$9,498
6	$2,235.1	$7,062	$9,297
7	$2,290.7	$6,816	$9,107
8	$2,347.6	$6,579	$8,926
9	$2,405.9	$6,349	$8,755
10	$2,465.7	$6,128	$8,594
11	$2,527.0	$5,915	$8,442
12	$2,589.8	$5,708	$8,298
13	$2,654.1	$5,510	$8,164
14	$2,720.1	$5,318	$8,038
15	$2,787.7	$5,132	$7,920
16	$2,856.9	$287	$3,143
17	$2,927.9	$285	$3,213
18	$3,000.7	$284	$3,284
19	$3,075.3	$282	$3,358
20	$3,151.7	$281	$3,433
21	$3,230.0	$279	$3,509
22	$3,310.3	$278	$3,588
23	$3,392.5	$277	$3,669
24	$3,476.8	$275	$3,752
25	$3,563.2	$274	$3,837
		IRR	-3.00%
		NPV	($109,859.43)
		AROI	0.35%

Beach Administration Building - PV Solar System

Year	Energy Savings	SREC Sales	Cash Flow
0			($741,716)
1	$10,160.0	$45,768	$55,928
2	$10,412.4	$44,401	$54,813
3	$10,671.2	$43,061	$53,732
4	$10,936.4	$41,561	$52,497
5	$11,208.1	$40,112	$51,320
6	$11,486.6	$38,714	$50,201
7	$11,772.1	$37,365	$49,137
8	$12,064.6	$36,063	$48,128
9	$12,364.4	$34,806	$47,171
10	$12,671.7	$33,593	$46,265
11	$12,986.6	$32,422	$45,409
12	$13,309.3	$31,293	$44,602
13	$13,640.0	$30,202	$43,842
14	$13,979.0	$29,149	$43,128
15	$14,326.4	$28,134	$42,460
16	$14,682.4	$1,571	$16,253
17	$15,047.2	$1,563	$16,610
18	$15,421.2	$1,555	$16,976
19	$15,804.4	$1,547	$17,352
20	$16,197.1	$1,539	$17,737
21	$16,599.6	$1,532	$18,131
22	$17,012.1	$1,524	$18,536
23	$17,434.9	$1,517	$18,951
24	$17,868.1	$1,509	$19,377
25	$18,312.1	$1,501	$19,814
		IRR	2.10%
		NPV	($57,507.64)
		AROI	3.54%

IRR, NPV, AROI - Wind Energy Systems

Financial Calculations

Based on inflation of:	3%
O&M inflation:	3%

Wind Turbine - Minimum Wind Speed

REIP Incentive: $11,104

Year	Energy Savings	REC Sales	Cash Flow
0			($10,771)
1	$584.7	$87	$671
2	$599.2	$86	$686
3	$614.1	$86	$700
4	$629.4	$85	$715
5	$645.0	$85	$730
6	$661.0	$85	$746
7	$677.5	$84	$762
8	$694.3	$84	$778
9	$711.6	$83	$795
10	$729.2	$83	$812
11	$747.4	$83	$830
12	$765.9	$82	$848
13	$785.0	$82	$867
14	$804.5	$81	$886
15	$824.5	$81	$905
16	$845.0	$80	$925
17	$866.0	$80	$946
18	$887.5	$80	$967
19	$909.5	$79	$989
20	$932.1	$79	$1,011
21	$955.3	$78	$1,034
22	$979.0	$78	$1,057
23	$1,003.4	$78	$1,081
24	$1,028.3	$77	$1,106
25	$1,053.8	$77	$1,131
		IRR	5.79%
		NPV	$4,035.11
		AROI	2.23%

Wind Turbine - Maximum Wind Speed

REIP Incentive: $21,875

Year	Energy Savings	REC Sales	Cash Flow
0			$0
1	$1,342.9	$199	$1,542
2	$1,376.3	$198	$1,575
3	$1,410.5	$197	$1,608
4	$1,445.6	$196	$1,642
5	$1,481.5	$195	$1,677
6	$1,518.3	$194	$1,713
7	$1,556.0	$193	$1,749
8	$1,594.7	$192	$1,787
9	$1,634.3	$191	$1,826
10	$1,674.9	$190	$1,865
11	$1,716.6	$190	$1,906
12	$1,759.2	$189	$1,948
13	$1,802.9	$188	$1,991
14	$1,847.7	$187	$2,034
15	$1,893.7	$186	$2,079
16	$1,940.7	$185	$2,126
17	$1,988.9	$184	$2,173
18	$2,038.4	$183	$2,221
19	$2,089.0	$182	$2,271
20	$2,140.9	$181	$2,322
21	$2,194.1	$180	$2,374
22	$2,248.7	$179	$2,428
23	$2,304.5	$178	$2,483
24	$2,361.8	$178	$2,539
25	$2,420.5	$177	$2,597
		IRR	N/A
		NPV	$34,007.11
		AROI	N/A

Wind Turbine - Average Wind Speed

REIP Incentive: $19,648

Year	Energy Savings	REC Sales	Cash Flow
0			($2,227)
1	$1,034.6	$154	$1,188
2	$1,060.3	$153	$1,213
3	$1,086.6	$152	$1,239
4	$1,113.7	$151	$1,265
5	$1,141.3	$150	$1,292
6	$1,169.7	$150	$1,319
7	$1,198.8	$149	$1,348
8	$1,228.5	$148	$1,377
9	$1,259.1	$147	$1,407
10	$1,290.4	$147	$1,437
11	$1,322.4	$146	$1,468
12	$1,355.3	$145	$1,501
13	$1,389.0	$145	$1,534
14	$1,423.5	$144	$1,567
15	$1,458.9	$143	$1,602
16	$1,495.1	$142	$1,637
17	$1,532.3	$142	$1,674
18	$1,570.3	$141	$1,711
19	$1,609.4	$140	$1,750
20	$1,649.4	$140	$1,789
21	$1,690.3	$139	$1,829
22	$1,732.3	$138	$1,871
23	$1,775.4	$137	$1,913
24	$1,819.5	$137	$1,956
25	$1,864.7	$136	$2,001
		IRR	55.47%
		NPV	$23,971.70
		AROI	49.35%

IRR, NPV, AROI - Computer Power Management Software

Financial Calculations

Based on inflation of: 3%

O&M inflation: 3%

Glassboro High School		
Computer Power Management Software		
Year	Energy Savings	Cash Flow
0		($2,410)
1	$3,638.8	$3,639
2	$3,747.96	$3,748
3	$3,860.40	$3,860
4	$3,976.22	$3,976
5	$4,095.50	$4,096
	IRR	152.25%
	NPV	$15,253.68
	AROI	146.96%

Glassboro Intermediate School		
Computer Power Management Software		
Year	Energy Savings	Cash Flow
0		($1,233)
1	$2,004.2	$2,004
2	$2,064.33	$2,064
3	$2,126.26	$2,126
4	$2,190.04	$2,190
5	$2,255.74	$2,256
	IRR	164.11%
	NPV	$8,496.33
	AROI	158.57%

Thomas E. Bowe School		
Computer Power Management Software		
Year	Energy Savings	Cash Flow
0		($1,914)
1	$3,111.1	$3,111
2	$3,204.43	$3,204
3	$3,300.57	$3,301
4	$3,399.58	$3,400
5	$3,501.57	$3,502
	IRR	164.11%
	NPV	$13,188.83
	AROI	158.58%

Dorothy Bullock School		
Computer Power Management Software		
Year	Energy Savings	Cash Flow
0		($1,159)
1	$2,019.2	$2,019
2	$2,079.78	$2,080
3	$2,142.17	$2,142
4	$2,206.43	$2,206
5	$2,272.63	$2,273
	IRR	175.93%
	NPV	$8,642.74
	AROI	170.19%

J. Harvey Rodgers School		
Computer Power Management Software		
Year	Energy Savings	Cash Flow
0		($957)
1	$1,666.6	$1,667
2	$1,716.60	$1,717
3	$1,768.10	$1,768
4	$1,821.14	$1,821
5	$1,875.77	$1,876
	IRR	175.92%
	NPV	$7,133.49
	AROI	170.18%

Beach Administration Building		
Computer Power Management Software		
Year	Energy Savings	Cash Flow
0		($239)
1	$416.7	$417
2	$429.20	$429
3	$442.08	$442
4	$455.34	$455
5	$469.00	$469
	IRR	175.94%
	NPV	$1,783.62
	AROI	170.21%

IRR, NPV, AROI - HVAC ECRMS

Boiler Upgrade Dorothy Bullock School		Boiler Upgrade Elsmere School		Boiler Upgrade Glassboro High School		Boiler Upgrade Glassboro Intermediate School		Building Management System Glassboro High School		Building Management System Glassboro Intermediate School		Building Management System J. Harvey Rodgers School	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	($177,563.00)	0	($42,283.00)	0	($193,718.00)	0	($233,670.00)	0	($65,501.00)	0	($34,886.00)	0	($22,535.00)
1	$20,013.00	1	$2,129.00	1	$26,322.00	1	$29,644.00	1	$20,811.00	1	$22,296.00	1	$5,002.00
2	$20,613.39	2	$2,192.87	2	$27,111.66	2	$30,533.32	2	$21,435.33	2	$22,964.88	2	$5,152.06
3	$21,231.79	3	$2,258.66	3	$27,925.01	3	$31,449.32	3	$22,078.39	3	$23,653.83	3	$5,306.62
4	$21,868.75	4	$2,326.42	4	$28,762.76	4	$32,392.80	4	$22,740.74	4	$24,363.44	4	$5,465.82
5	$22,524.81	5	$2,396.21	5	$29,625.64	5	$33,364.58	5	$23,422.96	5	$25,094.34	5	$5,629.80
6	$23,200.55	6	$2,468.09	6	$30,514.41	6	$34,365.52	6	$24,125.65	6	$25,847.17	6	$5,798.69
7	$23,896.57	7	$2,542.14	7	$31,429.84	7	$35,396.49	7	$24,849.42	7	$26,622.59	7	$5,972.65
8	$24,613.47	8	$2,618.40	8	$32,372.74	8	$36,458.38	8	$25,594.91	8	$27,421.27	8	$6,151.83
9	$25,351.87	9	$2,696.95	9	$33,343.92	9	$37,552.13	9	$26,362.75	9	$28,243.91	9	$6,336.38
10	$26,112.43	10	$2,777.86	10	$34,344.24	10	$38,678.70	10	$27,153.63	10	$29,091.22	10	$6,526.48
11	$26,895.80	11	$2,861.20	11	$35,374.57	11	$39,839.06	11	$27,968.24	11	$29,963.96	11	$6,722.27
12	$27,702.67	12	$2,947.03	12	$36,435.80	12	$41,034.23	12	$28,807.29	12	$30,862.88	12	$6,923.94
13	$28,533.75	13	$3,035.44	13	$37,528.88	13	$42,265.26	13	$29,671.51	13	$31,788.76	13	$7,131.66
14	$29,389.77	14	$3,126.51	14	$38,654.74	14	$43,533.21	14	$30,561.66	14	$32,742.43	14	$7,345.61
15	$30,271.46	15	$3,220.30	15	$39,814.39	15	$44,839.21	15	$31,478.50	15	$33,724.70	15	$7,565.97
16	$31,179.60	16	$3,316.91	16	$41,008.82	16	$46,184.39						
17	$32,114.99	17	$3,416.42	17	$42,239.08	17	$47,569.92						
18	$33,078.44	18	$3,518.91	18	$43,506.26	18	$48,997.02						
19	$34,070.79	19	$3,624.48	19	$44,811.44	19	$50,466.93						
20	$35,092.92	20	$3,733.21	20	$46,155.79	20	$51,980.93						
21	$36,145.70	21	$3,845.21	21	$47,540.46	21	$53,540.36						
22	$37,230.08	22	$3,960.57	22	$48,966.67	22	$55,146.57						
23	$38,346.98	23	$4,079.38	23	$50,435.67	23	$56,800.97						
24	$39,497.39	24	$4,201.77	24	$51,948.74	24	$58,505.00						
IRR	13.07%	IRR	4.36%	IRR	15.76%	IRR	14.73%	IRR	34.17%	IRR	66.87%	IRR	23.79%
NPV	$288,759.33	NPV	$7,324.77	NPV	$419,610.16	NPV	$457,063.98	NPV	$237,571.82	NPV	$289,813.03	NPV	$50,309.66
AROI	7.10%	AROI	0.87%	AROI	9.42%	AROI	8.52%	AROI	25.11%	AROI	57.24%	AROI	15.53%

Lighting Maintenance Cost Savings

T12 to T8 Retrofit		T12 Bulb Cost	T8 Blub 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
25	Watt	$23.0	$27.0	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	Induction 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 Indcution 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)
250	Watt	$80.0	$390.0	4.6	22.8	5	$400.0	1
175	Watt	$78.0	$380.0	4.6	22.8	5	$390.0	1
150	Watt	$74.0	$380.0	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

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	Replacements Over Lifetime (15 Yrs)
6	Lamp	$86.0	$288.0	4.6	5.7	1.25	$107.5	3
4	Lamp	$48.0	$174.0	4.6	5.7	1.25	$60.0	3

Interior & Exterior

Building	INC-CFL (13W)	T12->T8 (1 Lamp)	MH->FL (400W)	MH->INDUCTION (400W)	HPS->INCUCTION (70W)	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Glassboro High School	$3,525.9	$0.0	$0.0	$282.5	$142.4	$3,950.8	$263.38	Glassboro High School
Glassboro Intermediate School	$1,763.0	$0.0	$0.0	$0.0	$60.2	$1,823.2	$121.55	Glassboro Intermediate School
Thomas E. Bowe School	$0.0	$0.0	$1,808.1	$325.0	$273.8	$2,406.8	$160.45	Thomas E. Bowe School
Dorothy Bullock School	$0.0	$0.0	$2,260.1	$0.0	$164.3	$2,424.3	$161.62	Dorothy Bullock School
J. Harvey Rodgers School	$2,820.7	$0.0	$847.5	$0.0	$383.3	$4,051.5	$270.10	J. Harvey Rodgers School
Elsmere School	$705.2	$0.0	$0.0	$0.0	$109.5	$814.7	$54.31	Elsmere School
Beach Administration Building	$3,525.9	$16.4	$0.0	$0.0	$11.0	$3,553.2	$236.88	Beach Administration Building

Interior

Building	INC-CFL (13W)	T12->T8 (1 Lamp)	MH->FL (400W)	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Glassboro High School	$3,525.9	$0.0	$0.0	$3,525.9	$235.06	Glassboro High School
Glassboro Intermediate School	$1,763.0	$0.0	$0.0	$1,763.0	$117.53	Glassboro Intermediate School
Glassboro Intermediate School Annex	$0.0	$0.0	$0.0	$0.0	$0.00	Glassboro Intermediate School Annex
Thomas E. Bowe School	$0.0	$0.0	$1,808.1	$1,808.1	$120.54	Thomas E. Bowe School
Dorothy Bullock School	$0.0	$0.0	$2,260.1	$2,260.1	$150.67	Dorothy Bullock School
J. Harvey Rodgers School	$2,820.7	$0.0	$847.5	$3,668.3	$244.55	J. Harvey Rodgers School
Elsmere School	$705.2	$0.0	$0.0	$705.2	$47.01	Elsmere School
Beach Administration Building	$0.0	$16.4	$0.0	$16.4	$1.09	Beach Administration Building

Interior & Exterior

Building	INC-CFL (13W)	MH->INDUCTION (400W)	HPS->INCUCTION (70W)	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Glassboro High School	$0.0	$282.5	$142.4	$424.9	$28.32	Glassboro High School
Glassboro Intermediate School	$0.0	$0.0	$60.2	$60.2	$4.02	Glassboro Intermediate School
Thomas E. Bowe School	$0.0	$325.0	$273.8	$598.8	$39.92	Thomas E. Bowe School
Dorothy Bullock School	$0.0	$0.0	$164.3	$164.3	$10.95	Dorothy Bullock School
J. Harvey Rodgers School	$0.0	$0.0	$383.3	$383.3	$25.55	J. Harvey Rodgers School
Elsmere School	$0.0	$0.0	$109.5	$109.5	$7.30	Elsmere School
Beach Administration Building	$3,525.9	$0.0	$11.0	$3,536.9	$235.79	Beach Administration Building

APPENDIX J

WINDCAD MODELS

WindCad Turbine Performance Model

WES Tulipo Wind Turbine, Grid - Intertie

Prepared For: **Glassboro School District**
Site Location: **Glassboro, NJ**
Data Source: **NASA Atmospheric Science Data Center**
Date: **4/26/2010**

2.5 kW

Inputs:

Ave. Wind (m/s) =	3.89
Weibull K =	2
Site Altitude (m) =	0
Wind Shear Exp. =	0.180
Anem. Height (m) =	20
Tower Height (m) =	20
Turbulence Factor =	8.0%

Results:

Hub Average Wind Speed (m/s) =	3.89
Air Density Factor =	0%
Average Output Power (kW) =	0.40
Daily Energy Output (kWh) =	9.5
Annual Energy Output (kWh) =	**3,470**
Monthly Energy Output =	289
Percent Operating Time =	52.6%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	9.94%	0.000
2	0.00	16.98%	0.000
3	0.06	19.61%	0.012
4	0.22	18.12%	0.041
5	0.49	14.14%	0.069
6	0.88	9.54%	0.084
7	1.43	5.64%	0.081
8	1.99	2.94%	0.058
9	2.28	1.36%	0.031
10	2.39	0.56%	0.013
11	2.42	0.20%	0.005
12	2.39	0.07%	0.002
13	2.39	0.02%	0.000
14	2.35	0.01%	0.000
15	2.02	0.00%	0.000
16	1.80	0.00%	0.000
17	1.63	0.00%	0.000
18	1.38	0.00%	0.000
19	1.21	0.00%	0.000
20	0.97	0.00%	0.000
2008, BWC	Totals:	99.12%	0.396

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

WES Tulipo Wind Turbine, Grid - Intertie

Prepared For:	**Glassboro School District**
Site Location:	**Glassboro, NJ**
Data Source:	**NASA Atmospheric Science Data Center**
Date:	**4/26/2010**

2.5 kW

Inputs:

Ave. Wind (m/s) =	5.67
Weibull K =	2
Site Altitude (m) =	0
Wind Shear Exp. =	0.180
Anem. Height (m) =	20
Tower Height (m) =	20
Turbulence Factor =	8.0%

Results:

Hub Average Wind Speed (m/s) =	5.67
Air Density Factor =	0%
Average Output Power (kW) =	0.91
Daily Energy Output (kWh) =	21.8
Annual Energy Output (kWh) =	**7,970**
Monthly Energy Output =	664
Percent Operating Time =	74.0%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	4.81%	0.000
2	0.00	8.93%	0.000
3	0.06	11.84%	0.007
4	0.22	13.29%	0.030
5	0.49	13.31%	0.065
6	0.88	12.18%	0.107
7	1.43	10.31%	0.147
8	1.99	8.15%	0.162
9	2.28	6.03%	0.137
10	2.39	4.19%	0.100
11	2.42	2.75%	0.066
12	2.39	1.70%	0.041
13	2.39	1.00%	0.024
14	2.35	0.55%	0.013
15	2.02	0.29%	0.006
16	1.80	0.14%	0.003
17	1.63	0.07%	0.001
18	1.38	0.03%	0.000
19	1.21	0.01%	0.000
20	0.97	0.01%	0.000
2008, BWC	Totals:	99.59%	0.910

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

WES Tulipo Wind Turbine, Grid - Intertie

Prepared For:	**Glassboro School District**
Site Location:	**Glassboro, NJ**
Data Source:	**NASA Atmospheric Science Data Center**
Date:	**4/26/2010**

2.5 kW

Inputs:

Ave. Wind (m/s) =	4.93
Weibull K =	2
Site Altitude (m) =	0
Wind Shear Exp. =	0.180
Anem. Height (m) =	20
Tower Height (m) =	20
Turbulence Factor =	8.0%

Results:

Hub Average Wind Speed (m/s) =	4.93
Air Density Factor =	0%
Average Output Power (kW) =	0.70
Daily Energy Output (kWh) =	16.8
Annual Energy Output (kWh) =	**6,140**
Monthly Energy Output =	512
Percent Operating Time =	67.1%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	6.31%	0.000
2	0.00	11.44%	0.000
3	0.06	14.58%	0.009
4	0.22	15.48%	0.035
5	0.49	14.43%	0.070
6	0.88	12.10%	0.107
7	1.43	9.24%	0.132
8	1.99	6.48%	0.129
9	2.28	4.19%	0.095
10	2.39	2.50%	0.060
11	2.42	1.39%	0.034
12	2.39	0.72%	0.017
13	2.39	0.34%	0.008
14	2.35	0.15%	0.004
15	2.02	0.06%	0.001
16	1.80	0.02%	0.000
17	1.63	0.01%	0.000
18	1.38	0.00%	0.000
19	1.21	0.00%	0.000
20	0.97	0.00%	0.000
2008, BWC	Totals:	99.45%	0.701

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 FINANCIAL WORKSHEETS

Glassboro School District
(Minimum Average Site Wind Speed @20m – 8.70 mph)

Annual kWh	3,470
Engineer's Opinion of Probable Cost	$21,875.00

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	0.1685	3,470.0	$584.7	$87	$11,104	($69)	$602.0	$602.0
2	0.1736	3,452.7	$599.2	$86	$0	($69)	$616.5	$1,218.5
3	0.1788	3,435.4	$614.1	$86	$0	($69)	$631.3	$1,849.8
4	0.1841	3,418.2	$629.4	$85	$0	($68)	$646.5	$2,496.3
5	0.1896	3,401.1	$645.0	$85	$0	($68)	$662.0	$3,158.3
6	0.1953	3,384.1	$661.0	$85	$0	($68)	$678.0	$3,836.3
7	0.2012	3,367.2	$677.5	$84	$0	($67)	$694.3	$4,530.6
8	0.2072	3,350.4	$694.3	$84	$0	($67)	$711.1	$5,241.6
9	0.2135	3,333.6	$711.6	$83	$0	($67)	$728.2	$5,969.9
10	0.2199	3,316.9	$729.2	$83	$0	($66)	$745.8	$6,715.7
11	0.2264	3,300.4	$747.4	$83	$0	($66)	$763.9	$7,479.6
12	0.2332	3,283.9	$765.9	$82	$0	($66)	$782.4	$8,261.9
13	0.2402	3,267.4	$785.0	$82	$0	($65)	$801.3	$9,063.2
14	0.2474	3,251.1	$804.5	$81	$0	($65)	$820.7	$9,884.0
15	0.2549	3,234.8	$824.5	$81	$0	($65)	$840.6	$10,724.6
16	0.2625	3,218.7	$845.0	$80	$0	($64)	$861.0	$11,585.7
17	0.2704	3,202.6	$866.0	$80	$0	($64)	$882.0	$12,467.6
18	0.2785	3,186.6	$887.5	$80	$0	($64)	$903.4	$13,371.0
19	0.2869	3,170.6	$909.5	$79	$0	($63)	$925.4	$14,296.4
20	0.2955	3,154.8	$932.1	$79	$0	($63)	$947.9	$15,244.3
21	0.3043	3,139.0	$955.3	$78	$0	($63)	$971.0	$16,215.3
22	0.3135	3,123.3	$979.0	$78	$0	($62)	$994.6	$17,209.9
23	0.3229	3,107.7	$1,003.4	$78	$0	($62)	$1,018.9	$18,228.8
24	0.3325	3,092.1	$1,028.3	$77	$0	($62)	$1,043.8	$19,272.6
25	0.3425	3,076.7	$1,053.8	$77	$0	($62)	$1,069.2	$20,341.8

Glassboro School District
(Maximum Average Site Wind Speed @20m - 12.70 mph)

Annual kWh	7,970
Engineer's Opinion of Probable Cost	$21,875.00

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	0.1685	7,970.0	$1,342.9	$199	$25,504	($159)	$1,382.8	$1,382.8
2	0.1736	7,930.2	$1,376.3	$198	$0	($159)	$1,416.0	$2,798.8
3	0.1788	7,890.5	$1,410.5	$197	$0	($158)	$1,450.0	$4,248.7
4	0.1841	7,851.0	$1,445.6	$196	$0	($157)	$1,484.8	$5,733.6
5	0.1896	7,811.8	$1,481.5	$195	$0	($156)	$1,520.6	$7,254.1
6	0.1953	7,772.7	$1,518.3	$194	$0	($155)	$1,557.2	$8,811.3
7	0.2012	7,733.9	$1,556.0	$193	$0	($155)	$1,594.7	$10,406.0
8	0.2072	7,695.2	$1,594.7	$192	$0	($154)	$1,633.2	$12,039.2
9	0.2135	7,656.7	$1,634.3	$191	$0	($153)	$1,672.6	$13,711.8
10	0.2199	7,618.4	$1,674.9	$190	$0	($152)	$1,713.0	$15,424.8
11	0.2264	7,580.3	$1,716.6	$190	$0	($152)	$1,754.5	$17,179.3
12	0.2332	7,542.4	$1,759.2	$189	$0	($151)	$1,796.9	$18,976.2
13	0.2402	7,504.7	$1,802.9	$188	$0	($150)	$1,840.5	$20,816.7
14	0.2474	7,467.2	$1,847.7	$187	$0	($149)	$1,885.1	$22,701.8
15	0.2549	7,429.9	$1,893.7	$186	$0	($149)	$1,930.8	$24,632.6
16	0.2625	7,392.7	$1,940.7	$185	$0	($148)	$1,977.7	$26,610.3
17	0.2704	7,355.8	$1,988.9	$184	$0	($147)	$2,025.7	$28,636.0
18	0.2785	7,319.0	$2,038.4	$183	$0	($146)	$2,075.0	$30,711.0
19	0.2869	7,282.4	$2,089.0	$182	$0	($146)	$2,125.4	$32,836.4
20	0.2955	7,246.0	$2,140.9	$181	$0	($145)	$2,177.2	$35,013.6
21	0.3043	7,209.7	$2,194.1	$180	$0	($144)	$2,230.2	$37,243.8
22	0.3135	7,173.7	$2,248.7	$179	$0	($143)	$2,284.5	$39,528.3
23	0.3229	7,137.8	$2,304.5	$178	$0	($143)	$2,340.2	$41,868.5
24	0.3325	7,102.1	$2,361.8	$178	$0	($142)	$2,397.3	$44,265.9
25	0.3425	7,066.6	$2,420.5	$177	$0	($141)	$2,455.8	$46,721.7

Glassboro School District
(Average Site Wind Speed @20m - 11.03 mph)

Annual kWh	6,140
Engineer's Opinion of Probable Cost	$21,875.00

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	0.1685	6,140.0	$1,034.6	$154	$19,648	($123)	$1,065.3	$1,065.3
2	0.1736	6,109.3	$1,060.3	$153	$0	($122)	$1,090.8	$2,156.1
3	0.1788	6,078.8	$1,086.6	$152	$0	($122)	$1,117.0	$3,273.2
4	0.1841	6,048.4	$1,113.7	$151	$0	($121)	$1,143.9	$4,417.1
5	0.1896	6,018.1	$1,141.3	$150	$0	($120)	$1,171.4	$5,588.5
6	0.1953	5,988.0	$1,169.7	$150	$0	($120)	$1,199.6	$6,788.1
7	0.2012	5,958.1	$1,198.8	$149	$0	($119)	$1,228.5	$8,016.7
8	0.2072	5,928.3	$1,228.5	$148	$0	($119)	$1,258.2	$9,274.8
9	0.2135	5,898.7	$1,259.1	$147	$0	($118)	$1,288.6	$10,563.4
10	0.2199	5,869.2	$1,290.4	$147	$0	($117)	$1,319.7	$11,883.1
11	0.2264	5,839.8	$1,322.4	$146	$0	($117)	$1,351.6	$13,234.7
12	0.2332	5,810.6	$1,355.3	$145	$0	($116)	$1,384.3	$14,619.1
13	0.2402	5,781.6	$1,389.0	$145	$0	($116)	$1,417.9	$16,037.0
14	0.2474	5,752.7	$1,423.5	$144	$0	($115)	$1,452.2	$17,489.2
15	0.2549	5,723.9	$1,458.9	$143	$0	($114)	$1,487.5	$18,976.7
16	0.2625	5,695.3	$1,495.1	$142	$0	($114)	$1,523.6	$20,500.3
17	0.2704	5,666.8	$1,532.3	$142	$0	($113)	$1,560.6	$22,060.9
18	0.2785	5,638.5	$1,570.3	$141	$0	($113)	$1,598.5	$23,659.4
19	0.2869	5,610.3	$1,609.4	$140	$0	($112)	$1,637.4	$25,296.8
20	0.2955	5,582.2	$1,649.4	$140	$0	($112)	$1,677.3	$26,974.1
21	0.3043	5,554.3	$1,690.3	$139	$0	($111)	$1,718.1	$28,692.2
22	0.3135	5,526.5	$1,732.3	$138	$0	($111)	$1,760.0	$30,452.2
23	0.3229	5,498.9	$1,775.4	$137	$0	($110)	$1,802.9	$32,255.1
24	0.3325	5,471.4	$1,819.5	$137	$0	($109)	$1,846.9	$34,101.9
25	0.3425	5,444.1	$1,864.7	$136	$0	($109)	$1,891.9	$35,993.9

APPENDIX L

COMPUTER POWER MANAGEMENT SOFTWARE ANALYSIS

ECRM: Computer Power Management Software Installation

Software Cost (per computer) $18.40

Location	Desktop Computer Quantity	Watts	Electricity Costs ($/kWh)	Annual Operational Hours Before Software	Operational Hours After Software	Annual Energy Usage Cost Before	Annual Energy Usage Cost After	Annual Energy Cost Savings	Software Cost	Simple Payback
Glassboro High School	131.0	92.1	0.13	3,840.0	1,520.0	$6,023	$2,384	$3,638.8	$2,410.4	0.66
Glassboro Intermediate School	67.0	92.1	0.14	3,840.0	1,520.0	$3,317	$1,313	$2,004.2	$1,232.8	0.62
Thomas E. Bowe School	104.0	92.1	0.14	3,840.0	1,520.0	$5,149	$2,038	$3,111.1	$1,913.6	0.62
Dorothy Bullock School	63.0	92.1	0.15	3,840.0	1,520.0	$3,342	$1,323	$2,019.2	$1,159.2	0.57
J. Harvey Rodgers School	52.0	92.1	0.15	3,840.0	1,520.0	$2,759	$1,092	$1,666.6	$956.8	0.57
Beach Administration Building	13.0	92.1	0.15	3,840.0	1,520.0	$690	$273	$416.7	$239.2	0.57
					Totals	$21,280	$8,423	$12,857	$7,912	0.62

Assumptions	Before Implementation	After Implementation
Hours that computers are on:	24	9.5
Days per week computers are used:	5	5
Months per year computers are used:	8	8