ENERGY EFFICIENCY AND CONSERVATION STRATEGIC PLAN

PREPARED FOR: **TOWNSHIP OF WINSLOW**
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I. EXECUTIVE SUMMARY

Concord Engineering Group, Inc. (CEG) has been tasked with providing Winslow Township an Energy Efficiency and Conservation Strategic Plan (EECSP) in accordance with the requirements of the Federal Government's Energy Block Grant Program. Energy or sustainability plans are the basic building blocks used to implement energy efficiency strategies designed to reduce fossil fuel emissions in transportation, building, and other applicable public and private sectors. As part of the creation of the EECSP, a stepped approach has been utilized in order to provide a comprehensive analysis of current energy usage, energy savings opportunities and future considerations for new construction considering energy efficiency design standards. The steps utilized in the analysis are as follows:

- *Step 1 – Data Collection and Interpretation*
- *Step 2 – Analysis and Future Planning*
- *Step 3 – Energy Master Plan Reporting*

Overall, the implementation of the recommended measures utilizing the stepped approach noted within this EECSP will provide the Township with 5% reduction in green house gas emissions once completed. A further reduction will have to be achieved through purchasing 20% of the Township's pre-measured electric consumption from renewable energy sources. A summary of the recommended measures by phase is as follows. The specific phases of implementation are detailed in the **Energy Conservation Measure Implementation Phase Summary Appendix**.

Table 1 Summary of Recommended Measures

SUMMARY OF RECOMMENDED MEASURES							
PHASE	**COST**	**ELECT SAVINGS, KW**	**ELECT SAVINGS, KWH**	**NAT GAS SAVINGS, Therms**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK**	**CO2 EMISSIONS REDUCTION, lbs**
I	$10,200	0.00	37,652	1,201.0	$7,393	1.38	72,837.5
II	$52,226	25.12	92,258	0.0	$12,281	4.25	146,036.9
III	$27,600	15.00	15,600	664.0	$3,715	7.43	32,012.9
IV	$82,080	0.00	14,616	3,944.0	$8,856	9.27	66,611.1
V	$96,475	0.00	14,312	6,793.0	$12,944	7.42	97,534.7
Total	$268,581	40.12	174,438	12,602.0	$45,189	5.94	415,033.2

CEG also recommends that the Township continue its proactive effort towards energy procurement for the Township's electric and natural gas commodity service. In addition, the Township should continue to meet its renewable objectives by installing renewable energy systems such as the photovoltaic system slated for installation at the Senior Center. These above-mentioned efforts will continue to aid the Township in meeting energy and green house gas reduction goals.

II. INTRODUCTION

Concord Engineering Group, Inc. (CEG) has been tasked with providing Winslow Township an Energy Efficiency and Conservation Strategic Plan (EECSP) in accordance with the requirements of the Federal Government's Energy Block Grant Program. Energy or sustainability plans are the basic building blocks used to implement energy efficiency strategies designed to reduce fossil fuel emissions in transportation, building, and other applicable public and private sectors. Ambitious energy efficiency and greenhouse gas reduction goals require long-term strategic planning to effect lasting market transformation for energy efficiency. Various methodologies designed to reduce total energy use and improve energy efficiency include as their first step the development of an energy efficiency and conservation plan which becomes the road-map for detailing priorities, setting goals, and establishing objectives. As part of the creation of the EECSP, a stepped approach has been utilized in order to provide a comprehensive analysis of current energy usage, energy savings opportunities and future considerations for new construction considering energy efficiency design standards. The steps utilized in the analysis are as follows:

- *Step 1 – Data Collection and Interpretation*: During this step, Owner personnel are interviewed, field surveys are conducted to gather information of existing HVAC, plumbing and lightings systems, utility bills are collected and reviewed, and energy conservation measures (ECMs) are identified.

- *Step 2 – Analysis and Future Planning*: During this step, screening analysis is carried out for each facility and infrastructure system, feasibility analysis is completed to review possibility of centralizing HVAC systems, emergency generators or electrical distribution systems. Also, any future expansions to existing buildings or new construction are reviewed for energy impact. Another part of the analysis portion is reviewing existing utility rate structures to ensure the Owner is purchasing energy competitively in the current deregulated energy market.

- *Step 3 – Energy Master Plan Reporting*: During this step, the final energy master plan report is completed in order to provide the Owner with an all-inclusive view of the energy characteristics of the facilities being studied. Ranking of recommended energy conservation measures and renewable energy measures will be provided for the Owner to review implementation of the measures. In addition, LEED® / Energy Efficiency Design Standards for future renovations and/or new facilities will be provided in order to comply with the Owner's vision and commitment towards Greenhouse Gas Reduction.

This comprehensive report includes the energy consumption and resultant carbon footprint of the eight (8) Township owned facilities that equate to approximately 52, 900 SF of building, the Township pump stations and wells, the Township vehicle fleet and street lighting. The facilities that will be noted within this report in regards to energy conservation measures are defined in the table below:

Table 2: Township Facilities

TOWNSHIP FACILITIES		
FACILITY DESCRIPTION	**FACILITY AREA**	**FACILITY TYPE**
Municipal Building	24,000 SF	Office
DPW Office Building	1,000 SF	Office
DPW Garage	8,400 SF	Office / Garage
DPW Road Building	1,000 SF	Office / Storage
Police Records Building	5,300 SF	Office
Annex Building	4,000 SF	Office
Utilities Building	2,000 SF	Office
Senior Citizens Building	7,200 SF	Recreation

In order to provide a complete EECSP in accordance with the stepped approach noted above, CEG has worked in concert with the Township to develop their mission statement and energy savings plan moving forward. In addition, CEG has completed an analysis of the Township's energy usage, created an EPA Portfolio Manager account, performed field surveys identifying major energy consuming equipment and systems, calculated energy savings and estimated installation costs for both energy conservation measures and renewable energy measures, estimated current and future reduction in greenhouse gas emissions, reviewed installation funding options and developed a LEED® / Energy Efficiency Design Standard for the Township to utilize on existing and future facilities design and engineering projects.

The following sections of this report detail the above-mentioned effort.

III. TOWNSHIP MISSION STATEMENT

The Township of Winslow was created by an act of the Senate and General Assembly of the State of New Jersey on March 8, 1845. The Township, created from a part of Gloucester Township, contains approximately 57.4 square miles of land. The current population is over 38,000 residents as of numbers collected in the year 2000. The Township, having survived for over 165 years has developed into a prospering community with many local businesses, an ever-expanding public school system, a dedicated municipal government and a growing residential population. By making a commitment to meet or exceed the reduction in greenhouse gas emissions mandated by the State of New Jersey, the Township of Winslow is viewing energy efficiency and greenhouse gas and carbon footprint reductions as top priority in preserving the values and longevity of the community. By participating in such programs as the New Jersey Clean Energy's Local Government Energy Audit Program, the Township of Winslow is placing energy efficiency as the top priority as the Township continues to expand.

The creation of the Township's Energy Efficiency and Conservation Strategic Plan (EECSP) provides the Township with attainable goals to meet the commitment to operating efficiently at its existing facilities. Furthermore, with the establishment of design standards, contained within the EECSP, the Township will construct future facilities in accordance with LEED® and current building efficiency practices.

The Township of Winslow's goals for the future is to reduce their carbon footprint by 15%. This will be achieved through the implementation of the recommended Energy Conservation Measures that will save an estimated 174,438 kWh in electricity and 12,60 therms in natural gas consumption equating to a 5% reduction in emissions. The remaining 10% will need to be achieved through purchasing 20% of their electric consumption from renewable energy sources.

IV. FACILITY DESCRIPTIONS

A. MUNICIPAL BUILDING

Facility Description

The Municipal Building is located at 125 S. Route 73, in Winslow Township. The building was originally constructed in 1974 and has masonry exterior walls, consisting of concrete block and 4" face brick. Interior walls are metal stud with drywall. Roof framing is steel bar joists and roofing material is a single-ply rubber membrane. Windows are single-pane, tinted glass in aluminum frames.

The building houses most of the Township's administrative offices and departments including the Municipal Court and court offices, Clerk's Office, Planning, Treasury, Utilities and Tax offices, Police Department and Mayor's Office. First floor area is 15,230 sq. ft.

There is a half basement which is comprised of a boiler room, Police Muster Room, Evidence and Storage rooms. The basement is 4,266 sq. ft.

The Municipal Building is occupied approximately 90 hours per week.

Heating System

Heat is generated for different areas of the building using different gas-fired appliances. In the basement, a large gas-fired boiler, Weil-McLain model BL984 WF, 1,140.9 MBH of heat using 1,617 MBH of natural gas input. The boiler heats hot water which is circulated to an air handler in the basement.

When originally installed, this boiler also fed duct-mounted heating coils throughout the first floor.

In 1997, gas fired packaged rooftop heating and air conditioning units were installed to replace the original rooftop air conditioning units. And the duct mounted heating coils were taken out of service.

The first floor is provided heat by six (6) packaged rooftop heating and air conditioning units. Units are manufactured by AAON and were installed in 1997. Capacities for heating from the six (6) units range from 90-390 MBH natural gas input. All units were rated with an 80% combustion efficiency when new. These curb mounted units distribute forced hot air to the various independent zones throughout the first floor through sheet metal ducts.

Domestic Hot Water

Domestic hot water is produced by an Adamson DuraPak Hot Water Generator model PB-267-M. The unit was manufactured in 1975 and holds 163 gallons. A tube bundle heat exchanger

within the tank utilizes 22 gallons per minute of 200ºF boiler water to heat the domestic water. This type of appliance requires boiler water be available throughout the entire year.

Cooling System

Each of the six (6) AAON packaged rooftop units provides air conditioning to its' respective zone of service. All units were installed in 1997. Units range in cooling capacity from 5 to 25 tons of refrigeration.

Some office areas in the building have variable air volume (VAV) ceiling diffusers, which provide a local zone of heating and cooling control. Due to these VAV diffusers, rooftop air handlers that serve those spaces are equipped with an "Air Valve" (AV) which allows some supply air to bypass the duct system and enter the return duct. This action becomes necessary when VAV diffusers close. Rooftop units equipped with Air Valves serve the Administrative Offices (AC-3 B), and the Police Department (AC-3A).

The Tax Collectors Office HVAC system was renovated in 2009 and is now supplied via a 2.5 ton RUUD heat pump unit. The existing air valve supplied by AC-4 was removed when the new system was installed.

The air handler serving the basement is a Carrier model 39LA06 which was installed in 1997. This unit is equipped with a refrigerant coil and operates in conjunction with a remote mounted condensing unit located on the roof. The condensing unit is a Rheem model RAND-075 CAZ and was installed in 1997. Its capacity is 7 ½ tons of refrigeration.

A Sanyo Ductless Split System model US12ABMCF is installed with the indoor unit located in the Server Room and the outdoor unit located on the roof. The system was installed in 2004 and provides 1 ton of air conditioning.

Exhaust System

Six (6) curb-mounted, centrifugal exhaust fans are installed on the roof. Fans provide exhaust for public and private toilet rooms, a locker room, and cell area in the Police Department. Five (5) of the six fans are in poor condition and need replacement.

An inline style fan is installed in the basement and exhausts the electrical room and a storage room. This fan discharges its exhaust to an exterior stairwell.

Lighting

All general spaces including; private offices, corridors, conference rooms, police dispatch, lounge, mayor's office & locker room etc. are lit via 2-foot by 2-foot lay-in fixtures containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The public bathrooms are lit via incandescent ceiling fixtures and/or vanity fixtures containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The police locker room area bathroom is lit via incandescent ceiling fixtures. Standard switching is utilized and there are no other types of lighting controls present.
The police locker room area bathroom is lit via vanity fixture containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The police jail cells are lit via incandescent wall fixtures. Standard switching is utilized and there are no other types of lighting controls present.

Exit signs throughout the building contain incandescent lamps and consume an estimated 40 watts of electricity per sign.

The exterior under canopy and building mounted flood lighting include an assortment of wall packs with metal halide & incandescent down light fixtures.

B. DEPARTMENT OF PUBLIC WORKS OFFICE BUILDING

Facility Description

The Public Works Office is comprised of two (2) "mobile office" type trailers. These trailers were placed on a foundation and joined for a permanent installation in 2008. The structure has a pitched roof with asphalt shingles, vinyl siding, double-pane, insulating, double-hung windows, and a simulated stone foundation. Each trailer is twelve (12) feet by fifty five (55) feet, making a total floor area of 1,320 sq. ft.

The Public Works Office is occupied approximately 40 hours per week.

Heating System

Each section of the building has a Bard WG-362-AxB wall mounted heating and cooling unit. The wall mounted units utilizes natural gas for heating and have an input of 67,500 BTU/HR with an output of 45,000 BTU/HR. for a 67% combustion efficiency. Each unit (two total) distributes forced hot air through concealed ductwork to the various spaces within the building. Units are controlled by remote, wall mounted, digital thermostats.

Domestic Hot Water

Hot water for the building is produced by a ten (10) gallon electric water heater located below the Break Room sink. The water heater is a State Water Heater "Scout" model SCI 10 SOMS with ten gallons storage, 2,000 watts, and eight gallons per hour recovery at 90ºF rise.

The water heater provides hot water for the Break Room sink and a lavatory in the Men's and Women's toilet rooms.

Cooling System

The wall mounted Bard units each provide three (3) tons of cooling for the office areas within the building. Each unit generates 1,100 cubic feet per minute of cool air, providing 34,400 BTU/HR of cooling with an Energy Efficiency Ratio (EER) of 9.0. Both units are in excellent condition.

Exhaust System

Each toilet room is equipped with a small, ceiling recessed, cabinet type exhaust fan which is controlled by a local wall switch.

Lighting

All general spaces including; corridor, offices, closet & reception area are lit via 1-foot by 4-foot lay-in fixtures containing T8 lamps and electronic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The men's & women's toilet rooms are lit via combination fan/light fixture containing fluorescent lamps. Standard switching is utilized and there are no other types of lighting controls present.

Exit signs throughout the building contain LED lamps and consume an estimated 3 watts.

The exterior lighting is wall mounted fixtures containing metal halide lamps.

C. DEPARTMENT OF PUBLIC WORKS GARAGE

Facility Description

The Municipal Garage is located at the municipal complex at 125 S. Route 73, is a large volume, pre-fabricated metal building having an area of 8,530 sq. ft. and was erected in 1975. The building is used for the Township's vehicle maintenance operations. The building has two (2) distinct areas of operation; vehicle maintenance garage and office area.

The maintenance garage is a rigid steel frame building with insulated wall and roof panels, all covered by corrugated metal paneling.

The office area is concrete block with face brick construction. This area houses the office, parts, locker and bathrooms. The office area is one-story with a storage loft above that is open to the garage area.

The Municipal Garage is occupied approximately 40 hours per week.

Heating System

The office area has a Bard model MPG140D60C up-flow furnace. The furnace is natural gas-fired, has an input of 140,000 BTUHHR and a combustion efficiency of 80%. The furnace provides heat to the entire office area.

The garage area is heated by a large, gas-fired make-up air unit. The unit is manufactured by Reznor however the model number and exact capacity of the unit are unknown. It is estimated that the unit provides 8,000 CFM of heated, 100% outdoor air to the garage area. To heat this quantity of air to an acceptable temperature for a maintenance garage, the unit would require an output of approximately 450,000 BTU/H. A corresponding input is approximately 560,000 BTU/H of natural gas. Heated air from the make-up air unit is discharged at the rear end of the garage and thrown the entire length of the garage area.

Each vehicle work area within the garage is also heated with natural gas-fired, infrared heaters. Heaters are manufactured by Reflect-O-Ray however model numbers and capacities are unknown. Heaters have a four (4) inch diameter steel tube which radiates heat along its path. The tube terminates at a draft inducing fan which expels products of combustion to the outdoors. Four (4) different infrared heaters are installed within the garage.

Domestic Hot Water

Domestic hot water is produced for the bathroom in the office area by a 50 gallon electric water heater. The water heater is a John Wood model 6505DE and utilizes 4,500 watts to heat the water.

Cooling System

The garage area has no air conditioning and relies on ventilation for cooling. The office area is air conditioned by an add-on evaporator coil at the furnace and a 3 ton air cooled condensing unit. The condensing unit is a Rheem RAWD036JAZ and was installed in 2008. A window type air conditioner, also installed at the office, supplements the cooling requirement in the office area.

Exhaust Systems

A small cabinet exhaust fan controlled by the light switch provides exhaust for the bathroom. A large 45” x 45” propeller fan, mounted in the buildings end wall at the loft over the office provides exhaust for the garage area. This fan runs almost year round. It operates in conjunction with the Reznor make-up air unit in the winter as well as through the summer when it pulls ventilation air through the building from open overhead doors for cooling.

Lighting

The main garage & loft area are lit via 1-foot by 8-foot industrial fixtures containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The office and locker/break room are lit via 1-foot by 4-foot surface mounted fixtures containing T12 lamps and magnetic ballast. Standard switching is utilized and there are no other types of lighting controls present.

The office bathroom is lit via vanity fixture containing T12 lamps and magnetic ballast. Standard switching is utilized and there are no other types of lighting controls present.

The furnace room is lit via incandescent fixtures. Standard switching is utilized and there are no other types of lighting controls present.

The parts room is lit via 2-foot by 4-foot, 1-foot by 8-foot, and 1-foot by 4-foot surface mounted fixtures containing T12 lamps and magnetic ballast. Additional lighting is provided via incandescent fixtures. Standard switching is utilized and there are no other types of lighting controls present.

The bathroom/shower is lit via incandescent fixtures. Standard switching is utilized and there are no other types of lighting controls present.

The bathroom/shower is lit via vanity fixture containing T12 lamps and magnetic ballast. Standard switching is utilized and there are no other types of lighting controls present.

Exit signs throughout the building contain incandescent lamps and consume an estimated 40 watts of electricity per sign.

The exterior lighting is mounted on the building and includes an assortment of wall packs, metal halide, and incandescent fixtures.

D. DEPARTMENT OF PUBLIC WORKS ROAD BUILDING

Facility Description

The Road Building is a one-story concrete block building approximately 1,000 sq. ft. in area. The building is used for employees' lockers, sign construction and storage. It has a shed type roof with asphalt shingle and has a concrete floor slab on grade. Windows are vinyl clad, replacement type, double-pane, insulating, double-hung.

The Road Building is occupied approximately 40 hours per week.

Heating System

A Bard MPG120D60C gas-fired furnace provides forced hot air to the various areas in the building. The unit has an input of 120,000 BTU/H and an output of 96,000 BTU/H with an 80% efficiency.

Domestic Hot Water

Hot water is produced for the toilet room and locker area by a Bradford White water heater model MI20U65513.

Cooling System

The Sign Shop and Locker Room are cooled via a window style air conditioners installed through a wall opening. The air conditioner capacity is approximately 3,000 BTU/HR.

Exhaust System

The toilet room is exhausted by a small ceiling mounted cabinet type exhaust fan that is controlled by a wall switch.

Lighting

All general spaces including; locker room, work shop, break room, furnace room and storage room are lit via 1-foot by 4-foot surface mounted fixtures containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The bathroom is lit via a combination fan/light containing an incandescent lamp. Standard switching is utilized and there are no other types of lighting controls present.

Exit signs throughout the building contain incandescent lamps and consume an estimated 40 watts of electricity per sign.

The one exterior light is mounted on the building and contains a metal halide lamp.

E. POLICE RECORDS BUILDING

Facility Description

The Police Records Building is located in the municipal complex at 125 S. Route 73. The building was constructed in 1984 and is a one-story, brick building, slab-on-grade, with tinted, fixed, double-pane insulating glass. The Records building is 4,000 sq. ft. and houses the Police Records Department and Criminal Investigation division.

The Police Records Building is occupied approximately 40 hours per week.

Heating System

Heat for the building comes in the form of forced hot air and is supplemented with strips of electric baseboard radiation located along exterior walls.

The forced hot air is generated by a packaged rooftop heating and cooling unit manufactured by Trane model TFYD151E3HNA, produces 4,400 cubic feet per minute (CFM) of warmed air heated by 250,000 BTU/HR of natural gas. The units' burner is rated at 81% efficient to produce an output of 202,500 BTU/HR. The rooftop unit was installed in 2009.

Domestic Hot Water

Domestic hot water is produced by a 40 gallon electric hot water heater model E1F40RD045V as manufactured by Whirlpool. Hot water provided by this water heater is distributed to the lunch room, a powder room and Men's and Women's toilet rooms. The electric water heater operates with a 4,500 watt heat element.

Cooling System

Air conditioning for the Records building is also provided by the Trane packaged rooftop unit. The unit has a capacity of twelve and a half (12.5) tons of refrigeration with an Energy Efficiency Ration (EER) of 12.6. The unit is controlled by a wall mounted, programmable, digital thermostat.

Exhaust System

Toilet rooms are exhausted by ceiling mounted cabinet fans with exhaust discharge at the underside of exterior soffits. A roof mounted centrifugal exhaust fan exhausts the ceiling plenum to remove conditioned outdoor air and maintain the buildings air pressure balance.

Lighting

All general spaces including; records area, men's & women's toilet rooms, workroom, employee lounge, Captain's office & meeting rooms are lit via 2-foot by 4-foot lay-in fixtures containing

T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The janitor' closet is lit via 1-foot by 4-foot fixture containing T12 lamps and magnetic ballast. Standard switching is utilized and there are no other types of lighting controls present.

The employee lounge bathroom is lit via incandescent light fixture. Standard switching is utilized and there are no other types of lighting controls present.

The main records area is lit via 1-foot by 4-foot pendant fixtures containing T12 lamps and magnetic ballast. Standard switching is utilized and there are no other types of lighting controls present.

The vestibule is lit via incandescent fixtures. Standard switching is utilized and there are no other types of lighting controls present.

Exit signs throughout the building contain incandescent lamps and consume an estimated 40 watts of electricity per sign.

The exterior under canopy and building mounted flood lighting include an assortment of wall packs with metal halide & incandescent down light fixtures.

F. ANNEX BUILDING

Facility Description

The Winslow Township Annex Building is located at 402 Tansboro Road, Berlin, N.J. The building was constructed in 1937 and was originally a school. Today the building serves the Township by housing the office of the Tax Assessor, the Construction Department and the Emergency Management Office.

The building is two (2) stories with office areas on the second floor and a large meeting hall on the first floor. The first floor also includes records storage, the O.E.M. Office, a kitchen, public restrooms, electric and boiler rooms, as well as other closets and utility spaces. Each floor is 3,600 sq. ft. for a total of 7,200 sq. ft. of usable interior space.

The building has masonry exterior walls and wood frame and plaster interior walls. Floor/ceiling assemblies and roof framing area also of wood construction. Windows on the first floor are single-pane clear glass with wooden grilles dividing the panes on each sash. These windows appear to be original. Windows on the second floor are vinyl clad, double-pane, clear, insulating type replacement windows. All windows are double-hung style.

The Annex Building is occupied approximately 60 hours per week.

Heating System

Heat for the building is produced by a natural gas-fired hot water boiler located in a boiler room in the basement. The boiler is an HB Smith model GB100-W-12 HS1D with 275,000 BTU/H input. The boiler has an automatic vent damper and a rated combustion efficiency of 83% when new.

Heating hot water is distributed through six (6) zone valves by a small, inline, cartridge type circulator. Zone valves are associated with six (6) thermostats in the building, two (2) on the first floor and four (4) on the second floor. Each thermostat on the second floor is located in a different office and controls heating water flow through finned-tube radiators that line the exterior walls. Two (2) thermostats on the first floor control zone valves that serve the north and south sides of the floor.

Finned-tube radiators are the sole form of terminal heating elements throughout the building. Radiators have a ¾” copper tube with 1 ½” x 2” aluminum fins in a 6 ¾” high steel enclosure.

Domestic Hot Water

Domestic hot water is produced by a 40 gallon, natural gas-fired water heater. The water heater is manufactured by Bradford White model MI40356FBN4. The heater has 40,000 BTU/H of natural gas input and a 42 gallon/hour recovery rate at 90ºF.

Cooling System

Air conditioning is currently provided by numerous window air conditioning units that are installed and removed seasonally. Each air conditioning unit is approximately 5,000 BTU/H and twelve (12) are installed.

Central air conditioning was recently installed and consists of four RHEEM ducted split systems ranging in size from 2.5 ton to 4 ton cooling capacity.

Exhaust System

Exhaust fans exist in all toilet rooms in the building. Small cabinet fans are installed in three (3) different private toilet rooms. The public restrooms on the first floor each have a 14" diameter, sidewall exhaust fan. Both fans are no longer operable and it is recommended that these fans be replaced.

Lighting System

The offices, lobby and stairwells on the first floor are lit via 2-foot by 4-foot lay-in fixtures containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The offices in the basement are lit via 2-foot by 4-foot lay-in fixtures containing T8 lamps and electronic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

Bathrooms on the first floor are lit via 2-foot by 2-foot lay-in fixtures containing T12 U-tube lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

All closets, boiler room, bathrooms and storage rooms in basement and first floor are lit via incandescent fixtures and magnetic ballasts.

General area and Kitchen in basement is lit via 2-foot by 4-foot lay-in fixtures containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The fenced in area in the basement is lit via 2-foot by 4-foot lay-in fixtures containing T8 lamps and electronic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

Exit signs throughout the building contain incandescent lamps and consume an estimated 40 watts of electricity per sign.

The exterior lighting is mounted to the building and includes an assortment of wall packs and incandescent fixtures.

G. UTILITIES BUILDING

Facility Description

The Winslow Township Municipal Utilities Operation Building is located at 700 Chews Landing Road in Sicklerville, NJ. The building, constructed in 2005, is a one-story, wood frame structure having a full basement. Basement walls are monolithic poured concrete as is the basement floor. Exterior walls are comprised of 2 x 6 stud framing and R-19 batt insulation. Siding includes 5/8" thick sheathing and clapboard siding. The roof is insulated with R-30, fiberglass batt insulation and all windows and doors are insulating type. Windows are double-pane with vinyl clad wood framing as manufactured by Andersen.

The Utilities Building is occupied approximately 40 hours per week. The facility is unoccupied Saturday and Sunday with the exception of a few hours at random times.

Heating System

The heating system consists of a gas-fired furnace manufactured by Rheem. The furnace is model 90RJ07EFS01, has 75,000 BTU/HR input and is 92% efficient. Supply and return air ducts extend from the furnace across the basement ceiling with branch ducts serving first floor outlets and return grilles. The furnace is controlled by a standard, heating and cooling digital thermostat.

Domestic Hot Water

Domestic hot water is produced by a Bradford White 75 gallon, gas-fired, hot water heater model MIITW75T6BN12 with 76,000 BTU/HR natural gas input, vent fan and PVC venting.

The water heater provides domestic hot water for the Men's and Women's locker rooms, break room sink and mop sink in the Janitor's Closet. A clothes washer and utility sink in the basement are also served from the water heater.

Cooling System

Cooling for the Utilities building is generated by use of the heating furnace and an add-on cooling coil along with a remote, air cooled condensing unit. The condensing unit is a Rheem model 10AJB48A01 and has a capacity of 4 tons of refrigeration. The three components of the system operate on an "as-needed" basis on a call for cooling by the remote mounted space thermostat

Lighting

All general spaces including; corridor, offices, lunch room, locker/bath rooms, file room and stairway are lit via 2-foot by 2-foot lay-in fixtures containing T8 lamps and electronic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The janitor's closet is lit via vanity fixture containing T8 lamps and electronic ballast. Standard switching is utilized and there are not other types of lighting controls present.

The lower level stairway is lit via wall mounted fixture containing T8 lamps and electronic ballast (same as janitor's closet). Standard switching is utilized and there are no other types of lighting controls present.

The basement is lit via 1-foot by 8-foot industrial channel fixtures containing T8 lamps and electronic ballast. Standard switching is utilized and there are no other types of lighting controls present.

Exit signs throughout the building contain LED lamps and consume an estimated 3 watts per sign.

The exterior lighting is wall mounted fixtures containing compact fluorescent lamps.

H. SENIOR CITIZENS BUILDING

Facility Description

The Winslow Township Senior Citizen's Building is located at 33 Coopers Folly Road in Winslow Township, New Jersey. The building was constructed in 1992 and is a single story structure with textured concrete block exterior. Wood truss framing forms a shed roof with textured asphalt shingles. All windows are double-pane, insulating type with anodized aluminum mullions and framing. The building's foundation is slab-on-grade. Operating hours for the building are somewhat random with the exception of Mondays (open 10AM – 12PM), Tuesdays and Thursdays (open 8AM – 3PM), and the building is closed on Fridays.

Heating System

Heat for the building is generated by a natural gas-fired hot water boiler. The boiler is a Weil-McLain model PFG-7-PI Series 3 having 390,000 BTW/H input. Its combustion efficiency when new was 80%.

Heating hot water is circulated via a Bell & Gossett Series 90 Inline Pump with ¾ horsepower motor to hot water coils at three (3) different air handlers in the building. Two (2) of the air handlers are dedicated to serve the Social Hall. One (1) air handler provides conditioned air to the north side of the room and the other air handler delivering air to the south side of the room. The third air handler serves common areas and an office near the entry of the building. All air handlers distribute conditioned air via sheet metal ductwork

The heating coils at each air handler are duct-mounted above the air handler and are piped with thermostatically controlled, 3-way control valves. Heating hot water, which flows continuously during the heating season at a constant flow rate, either flows through the heating coil or is diverted around it depending on the space temperature.

The office is equipped with a through-wall unit that has a hot water heating coil. This unit provides an individual zone of control of heating and cooling for the office. The unit is a McQuay model 16-07 packaged terminal air conditioner.

The public restrooms each have a ceiling recessed cabinet unit heater to address heating requirements in the restrooms.

Domestic Hot Water

Two (2) electric, storage type hot water heaters exist in the building. One (1) water heater is located in the Janitor Closet near the entry of the building. This water heater is a RUUD model PEP20-1 with 20 gallons storage, 5,000 watts, and 208 volts, single-phase power supply. This water heater provides hot water for the lavatories in the public restrooms and the mop sink in the Janitor's Closet.

The other water heater is located in the boiler room and supplies hot water to the kitchen. This water heater is a RUUD model EGLS 50 6 with 50 gallons storage and 6,000 watts at 208 volts, single-phase power. Both water heaters were installed in 1992 when the building was constructed.

Cooling System

The three (3) aforementioned air handlers described in the Heating System section each possess a refrigerant coil which works with an associated, air-cooled condensing unit to produce air conditioning for the building.

Both air handlers that serve the Social Hall are Snyder General model B080D3 with a 2 HP fan motor.

The remote condensing unit that serves the north side of the Social Hall is a McQuay 7 ½ ton unit model C080G0 and was installed at the time of the building construction in 1992. The condensing unit that serves the south side unit of the Social Hall was installed in 2004. The unit is a Rheem model RAWD 090 CAZ and has 7 ½ tons of refrigeration capacity.

The air handling unit serving the common areas near the building entry is a McQuay model BYME 036-0420 and has a ½ horsepower fan motor. The associated condensing is the original unit and is of unknown make and model, however has a 3 ton capacity.

Exhaust System

Each toilet room and the Janitor Closet are equipped with a 12” x 24” cabinet type exhaust fan that has its discharge ducted to an exterior wall grille located under the exterior soffit.

All exhaust fans run continuously.

An exterior wall mounted exhaust fan serves a range hood in the kitchen. This fan is manually controlled on an as-needed basis.

Lighting

The Main Lobby, vestibule, office & social hall are lit via 2-foot by 4-foot lay-in fixtures containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The coat closet & storage closet are lit via 1-foot by 4-foot surface mounted fixtures containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The men’s & women’s toilet rooms are lit via 1-foot by 4-foot lay-in fixtures and vanity wall mounted fixtures containing T12 lamps and magnetic ballasts. Standard switching is utilized and there are no other types of lighting controls present.

The janitor's closet, kitchen closet & AHU closets 1 & 2 are lit via incandescent fixtures. Standard switching is utilized and there are no other types of lighting controls present.

The mechanical room is lit via 1-foot by 4-foot in pendant fixtures containing T12 lamps and magnetic ballast. Standard switching is utilized and there are no other types of lighting controls present.

Exit signs throughout the building contain incandescent lamps and consume an estimated 5 watts of electricity per sign.

The under canopy lighting and exterior lighting mounted to the building are lit via wall packs containing metal halide lamps.

I. PUMP STATIONS & WELLS

The Township contains seventeen (17) pump stations and ten (10) wells located throughout the Township. These facilities are relatively small in nature and use only a minimal amount of electricity and natural gas compared to the large facilities owned by the Township. Future overhauls of pump stations should involve the installation of premium efficiency motors and variable speed drive controls to increase the efficiency of the stations.

J. VEHICLE FLEET

The Township has a vehicle fleet of one-hundred and sixty-three (163) unleaded gasoline and forty-seven (47) diesel operated vehicles. In 2008 the Township used 26,357 gallons of diesel fuel and 131,057 gallons of unleaded gasoline for use in its fleet. The average miles per gallons for the vehicle fleet based on city ratings from fueleconomy.gov came to 15 miles per gallon. This correlates to gasoline vehicles having a total driven miles of 19,500,000 or an average of 12,000 miles per vehicle. This number coincides with average U.S. driving habits, and given the fact that more miles are likely put on police vehicles means most of the non-law enforcement vehicles see less than average use.

K. STREET LIGHTING

Street lighting for the Township is currently billed through Atlantic City Electric's Street Lighting Lease services. Atlantic City Electric owns the lights and leases them to the Township, which is billed monthly for the fixture and its electric usage. The Township leases 3,033 streetlights of various wattage types that have an approximate annual electric usage of 1,202,637 kilowatt hours. In order for the Township to consider upgrades for Street lighting it would require them to purchase the existing lighting from Atlantic Electric and then retrofit to a more efficient fixture there after. This would require a large capital investment by the Township and also increase the maintenance duties of Public Works Department.

Recently, however Atlantic City Electric launched a Pilot Program for replacing standard Street Light fixtures with new energy efficient LED light fixtures. The program is currently only in the test stage for the next 6 months with installations occurring in various towns across their territory. The article excerpt below, quoted from ACE's website, states where the public can view the new fixtures and contact information to for public comment.

Atlantic City Electric Launches LED Streetlight Pilot Project
Monday, March 29, 2010

Energy-efficient Lights to Receive Test Run

MAYS LANDING, N.J. – Atlantic City Electric is installing various test models of new energy-efficient LED (light-emitting diode) streetlights in four New Jersey communities. The company will test the LED streetlights for a six-month period to gauge their suitability, actual energy-efficiency, reliability and illumination quality, and to obtain customer feedback.

"We will evaluate the lights based on their performance data and customer opinions at the end of the test period," said Atlantic City Electric Region President Vince Maione. "Atlantic City Electric is committed to evaluating and, if appropriate, seeking regulatory approval for new energy-efficient technologies that have the potential to save our customers money, help the environment and improve customer satisfaction."

Atlantic City Electric is launching the LED streetlight pilot project in Wenonah, Northfield, Hammonton, and Ocean City. This will give customers in different parts of our service territory the opportunity to experience the lights in real-life situations and provide us with their comments which can be emailed to LED@atlanticcityelectric.com.

Plans for further installation of LED streetlights will depend on customer feedback, technical results of the pilot program, regulatory approval and the evolution of the technology as an economically viable replacement for mercury vapor and high-pressure sodium lighting currently in use.

For more information on this and other Atlantic City Electric energy conservation programs, such as the free *My Account* home energy audit program, visit www.atlanticcityelectric.com.

Once the Pilot Program has been successfully completed and the resultant findings and cost reduction information are made available to the public the Township should analyze its potential cost and energy reductions utilizing this approach. If it proves favorable, the Township should further lobby Atlantic City Electric to be included in the first phase of the retrofit construction.

V. HISTORIC ENERGY CONSUMPTION ANALYSIS

A. TARIFF AND ENERGY PROCUREMENT ANALYSIS

Tariff Analysis

Winslow Township utilizes electricity and natural gas to heat, cool and operate the facilities included within the EECSP. The energy usage for each facility has been tabulated and will be detailed later within this section. Each energy source has been identified and monthly consumption and costs noted per the information provided by the Township. The electric to facilities is provided by Atlantic City Electric and the natural gas is provided by two sources. The commodity portion of the natural gas service is handled by Woodruff Energy and the delivery portion of the natural gas service is handled by South Jersey Gas. The following table defines by facility the utility, utility provider and respective tariff.

Table 3: Utility Provider and Tariff Definition

UTILITY PROVIDE AND TARIFF DEFINITION					
FACILITY DESCRIPTION	ELECTRIC		NATURAL GAS		
	PROVIDER	TARIFF	COMMODITY	DELIVERY	TARIFF
Municipal Building	ACE	AGS/ BGS	WE	SJG	GSG
DPW Office Building	ACE	MGS	WE	SJG	GSG
DPW Garage	ACE	MGS	WE	SJG	GSG
DPW Road Building	ACE	MGS	WE	SJG	GSG
Police Records Building	ACE	MGS	WE	SJG	GSG
Annex Building	ACE	MGS	SJG	SJG	GSG
Utilities Building	ACE	MGS	SJG	SJG	GSG
Senior Citizens Building	ACE	MGS	WE	SJG	GSG

Notes: ACE = Atlantic City Electric; AGS = Annual General Service;
BGS = Basic General Service, MGS = Monthly General Service
WE = Woodruff Energy; SJG = South Jersey Gas; GSG = General Service Gas

Electricity:

Winslow Township receives electric service from Atlantic City Electric on two different tariff rates. These rates are AGS (Annual General Service) and MGS (Monthly General Service). The Municipal Building is the only facility serviced under the AGS rate structure; all other facilities are serviced under the MGS rate structure. The following is a brief description of the rate structures and associated charges:

- *AGS Rate Structure*: The AGS Secondary (Annual General Service) utility rate is available at any point in the utility's system where facilities of adequate character and capacity exist for the entire electric service requirements of any customer contracting for annual service delivered at one point and metered at or compensated to the voltage of delivery. This delivery service includes the following charges: Delivery Service Charges, Distribution Demand Charges, Reactive Demand Charges, Distribution Rates, Non-Utility Generation Charges, Societal Benefits Charges, Regulatory Assets Recovery Charges, Transition Bond Charges, Market Transition Charge Tax, Transmission Demand Charge, Regional Greenhouse Gas Initiative Recovery Charge, and Infrastructure Investment Surcharge.

- *MGS Rate Structure*: The MGS (Monthly General Service) utility rate is available at any point of the utility's system where facilities of adequate character and capacity exist for the entire electric service requirements of any customer delivered at one point and metered at or compensated to the voltage of delivery. This schedule is not available to residential customers. This service includes the following charges: Delivery Service Charges, Distribution Demand Charges, Reactive Demand Charges, Non-Utility Generation Charges, Societal Benefits Charges, Regulatory Assets Recovery Charges, Transition Bond Charges, Market Transition Charge Tax, Transmission Demand Charge, Regional Greenhouse Gas Initiative Recovery Charge, and Infrastructure Investment Surcharge.

Natural Gas:

The Township has natural gas serviced by South Jersey Gas Company (SJG) on its firm delivery rate, General Service Gas (GSG) from the utility and BGSS (Basic Generation Supply Service) commodity when not being served by a Third Party Supplier (TPS). Currently the Township is procuring natural gas from a Third Party Supplier (TPS), Woodruff Energy. This Delivery Rate has the following charges: Customer Charge, Delivery Charge, BSC Volume Charge and Commodity Charge under this rate structure. The BGSS Supply rates are designed to recover SJG's cost of gas applicable to customers who purchase gas from SJG. The company earns no profit from BGSS. BGSS consists of two (2) pricing mechanisms: Residential and Commercial customers that use less than 5,000 therms annually and Commercial and Industrial customers that consume at least 5,000 therms annually.

Energy Procurement Analysis

Based on the energy consumed by the Township for electricity and natural gas CEG has concluded that the Township could seek more competitive energy pricing for commodity for both electricity and natural gas service. The Township is being proactive in regards to commodity pricing and is currently pursuing a commodity deal through the New Jersey Sustainable Energy Join Meeting (NJSEM). CEG recommends taking a global approach that will be consistent with all facilities within the Township.

Energy commodities are among the most volatile of all commodities, however at this point and time, energy is extremely competitive. The Township could see significant savings if it were to take advantage of these current market prices quickly, before energy increases. Based on the study period's historical consumption and current electric rates, the Township could see an improvement of up to 15 % in its electric costs annually. (Note: Savings were calculated using an Average Annual Consumption of 3.039,636 kWh and an Average fixed one-year commodity contract). CEG recommends aggregating the entire electric load to gain the most optimal energy costs. CEG recommends that the Township seek an energy advisor to maximize energy savings and to apply a "managed approach" to procuring energy.

CEG's secondary recommendation coincides with the Township's natural gas costs. Based on the current market, (which is very competitive), the Township could see a savings of up to 20% annually in its natural gas expenditures. Again, CEG recommends the use of an energy advisor to review alternative energy sourcing strategies and to setup a "managed approach" to energy procurement.

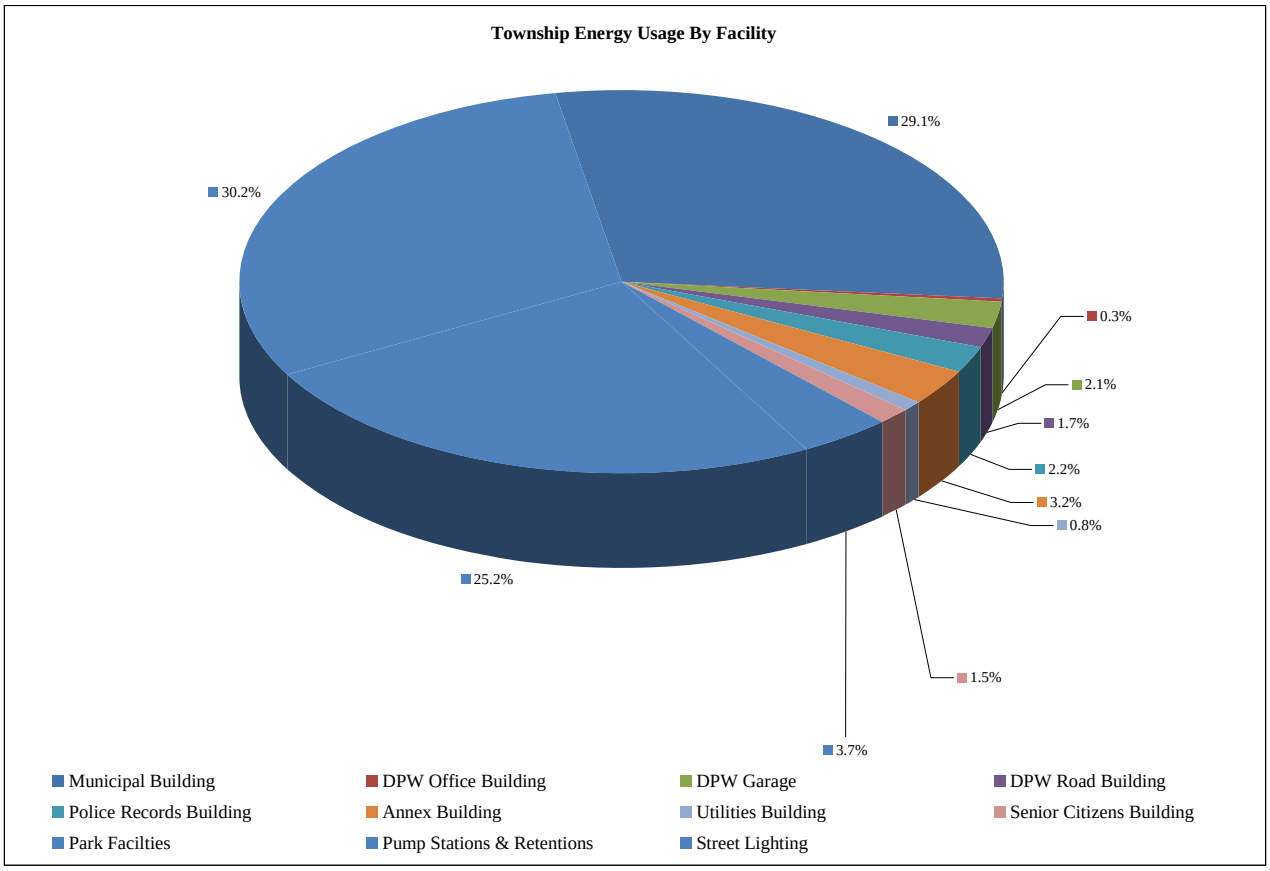
CEG also recommends that Winslow Township schedule a meeting with their current utility providers to review their utility charges and current tariff structures for electricity and natural gas. This meeting will provide insight regarding alternative procurement options that are currently available. Through its meeting with the Local Distribution Company (LDC), the Township will learn more about the competitive supply process and can acquire a list of approved Third Party Suppliers from the New Jersey Board of Public Utilities website at www.nj.gov/bpu. In addition, the Township should also ask the utility representative about alternative billing options. Some utilities allow for consolidated billing options when utilizing the service of a Third Party Supplier which provides for more manageable accounting.

To keep with its goals of reducing the Township's carbon footprint energy should be procured from renewable sources of generation such as wind, solar, biogas, and other technologies. Currently local utility companies do offer renewable energy purchasing through its standard rate structures. In order to coincide with its pursuit for low cost electric pricing when assembling procurement requests for proposal it should have stipulations for energy from renewable sources.

Overall, it is recommended that the Township continue its current positive outlook towards pursuing commodity deals through consortium-based groups such as the NJSEM or look to procuring energy on their own without the cooperative.

B. FACILITY ENERGY USAGE

The Township energy usage is consumed by various end users such as municipal office buildings, municipal garages, exterior parking lot lighting and pump stations. The goal of the EECSP is to attempt to reduce energy costs and greenhouse gas emissions for the various major energy consumers in the Township. These users and their respective energy usage for the study period (January 2009 to December 2009) are delineated in the table below. The pie graph following the table is a breakdown of the energy usage in percentage form by facility.



C. ENERGY USE INTENSITY (EUI)

Energy Use Intensity (EUI) is a measure of a building's annual energy utilization per square foot of building. This calculation is completed by converting all utility usage consumed by a building for one year, to British Thermal Units (BTU) and dividing this number by the building square footage. EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types. The Oak Ridge National Laboratory (ORNL) Buildings Technology Center under a contract with the U.S. Department of Energy maintains a Benchmarking Building Energy Performance Program. The ORNL website determines how a building's energy use compares with similar facilities throughout the U.S. and in a specific region or state.

Source use differs from site usage when comparing a building's energy consumption with the national average. Site energy use is the energy consumed by the building at the building site only. Source energy use includes the site energy use as well as all of the losses to create and distribute the energy to the building. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses, which allows for a complete assessment of energy efficiency in a building. The type of utility purchased has a substantial impact on the source energy use of a building. The EPA has determined that source energy is the most comparable unit for evaluation purposes and overall global impact. Both the site and source EUI ratings for the building are provided to understand and compare the differences in energy use.

The site and source EUI for this facility is calculated as follows:

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

$$Building\ \ Source\ \ EUI = \frac{(Electric\ Usage\ in\ kBtu\ \ X\ \ SS\ \ Ratio + Gas\ Usage\ in\ kBtu\ \ X\ \ SS\ \ Ratio)}{Building\ \ Square\ \ Footage}$$

***Note:** Calculated EUI only includes the eight (8) main Township facilities.

Table 4
Facility Energy Use Intensity (EUI) Calculation

ENERGY USE INTENSITY CALCULATION						
ENERGY TYPE	**BUILDING USE**			**SITE ENERGY**	**SITE-SOURCE RATIO**	**SOURCE ENERGY**
	kWh	**Therms**	**Gallons**	**kBtu**		**kBtu**
ELECTRIC	724135.0			2,472,197	3.340	8,257,138
NATURAL GAS		23555.0		2,355,500	1.047	2,466,209
FUEL OIL			0.0	0	1.010	0
PROPANE			0.0	0	1.010	0
			TOTALS	4,827,697		10,723,346
*Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued Dec 2007.						
BUILDING AREA		32,400	SQUARE FEET			
BUILDING SITE EUI		*149.00*	kBtu/SF/YR			
BUILDING SOURCE EUI		*330.97*	kBtu/SF/YR			

D. EPA ENERGY BENCHMARKING SYSTEM

The United States Environmental Protection Agency (EPA) in an effort to promote energy management has created a system for benchmarking energy use amongst various end users. The benchmarking tool utilized for this analysis is entitled Portfolio Manager. The Portfolio Manager tool allows tracking and assessment of energy consumption via the template forms located on the ENERGY STAR website (www.energystar.gov). The importance of benchmarking for local government municipalities is becoming more important as utility costs continue to increase and emphasis is being placed on carbon reduction, greenhouse gas emissions and other environmental impacts. Based on information gathered from the ENERGY STAR website, Government agencies spend more than $10 billion a year on energy to provide public services and meet constituent needs. Furthermore, energy use in commercial buildings and industrial facilities is responsible for more than 50 percent of U.S. carbon dioxide emissions. It is vital that local government municipalities assess facility energy usage, benchmark energy usage utilizing Portfolio Manager, set priorities and goals to lessen energy usage and move forward with priorities and goals.

CEG has created an ENERGY STAR account for the Township to access and monitor the various facilities yearly energy usage as it compares to facilities of similar type. The login page for the account can be accessed at the following web address; the username and password are also listed below:

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

User Name: winslowtownship
Password: rcastagna

The following table is a summary of the results for the Winslow Township facilities included within the ENERGY STAR Portfolio Manager account:

Table 5: ENERGY STAR Performance Rating

ENERGY STAR PERFORMANCE RATING		
FACILITY DESCRIPTION	**ENERGY PERFORMANCE RATING**	**NATIONAL AVERAGE**
Municipal Building	35	50
DPW Office Building	N/A	N/A
DPW Garage	89	50
DPW Road Building	N/A	N/A
Police Records Building	N/A	N/A
Annex Building	58	50
Utilities Building	N/A	N/A
Senior Citizens Building	N/A	N/A

Specific building types are detailed on the ENERGY STAR website. Non-typical buildings are covered by an "Other" category. The "Other" category is used if your building type or a section of the building is not represented by one of the specific categories. An Energy Performance Rating cannot be calculated if more than 10% of a building is classified as "Other." In addition, office buildings with less than 5000 S.F. cannot generate an Energy Performance Rating.

The DPW Office, Police Records Building and the Utilities Building are less than 5,000 square feet of office space and do not qualify for an ENERGY STAR rating. The Road Building and the Senior Citizens Building are classified as "Other" and also, do not qualify for an ENERGY STAR rating. Despite this, the EPA Portfolio Manager calculator still provides the building Energy Use Intensity (EUI) number in kBtu/SF.

The EUI of a facility is also an important tool that can be used to track energy efficiency. By comparing the calculated EUI to facilities of similar type and use, baselines for improvement can be set that the Township can strive to meet. CEG recommends that the Township keep their Portfolio Manager account up to date to monitor the performance of their facilities.

Refer to the **Statement of Energy Performance Appendix** for the detailed energy summary for each applicable facility.

VI. RECOMMENDED ENERGY CONSERVATION MEASURES

Implementation Strategy:

Concord Engineering Group, Inc. (CEG) has devised a phased approach to implementing the recommended Energy Conservation Measures (ECM) noted in the Township's "Local Government Energy Audits" completed in 2009 over a five year period. It should be noted this approach was devised not considering any necessary replacement for equipment being at the end of its useful life. The following table shows a summary of the total costs and associated savings for each phase. A more detailed summary sheet that shows each projects information is located in the **ECM Implementation Phase Summary Appendix**.

Table 6: ECM Implementation Phase Summary

ECM IMPLEMENTATION PHASING SUMMARY									
PHASE	COST	ELECT SAVINGS, KW	ELECT SAVINGS, KWH	ELECT CO2 REDUCTION	NAT GAS SAVINGS, Therms	NAT GAS CO2 REDUCTION	ANNUAL SAVINGS	SIMPLE PAYBACK	CO2 EMISSIONS REDUCTION, lbs
I	$10,200	0.00	37,652	59,599	1,201.0	13,238.21	$7,393	1.38	72,837.5
II	$52,226	25.12	92,258	146,037	0.0	0.00	$12,281	4.25	146,036.9
III	$27,600	15.00	15,600	24,694	664.0	7,319.35	$3,715	7.43	32,012.9
IV	$82,080	0.00	14,616	23,136	3,944.0	43,475.16	$8,856	9.27	66,611.1
V	$93,375	0.00	14,312	22,655	6,793.0	74,880.01	$12,877	7.25	97,534.7
Total	$265,481	40.12	174,438	276,120	12,602.0		$45,122	5.88	415,033.2

Measure Descriptions:

PHASE I

The first phase of implementation involves the lowest first cost investment, and is capable of being completed in a short period of time. The work entails installation of programmable thermostats in the Public Works Office, Public Works Garage, Utility Building, and Annex Building. Retro-commissioning will also be performed at the Municipal Building, Public Works Garage, Police Records Building, Senior Center, and Utility Building.

ECM-PG-6: Programmable Thermostat

Description:

The locker room air conditioning/heating unit has a standard, manual wall mounted thermostat. These indoor temperature controls are inaccurate due to temperature drift. These units also do not have unoccupied setback features.

New programmable thermostats are available that utilize programming schedules for occupied and unoccupied times and can be set to vary space temperature at these respective times. In addition, the programmable thermostats can be used in conjunction with a motion sensor. When the space is not occupied the equipment can operate at the unoccupied set-point. Once the space becomes occupied the motion sensor sends a signal to the thermostat to raise the temperature of the space to the occupied set-point. This control system approach is ideal for facilities with intermittent occupancy.

This energy conservation measure would replace the various HVAC unit thermostats with a programmable 7-day thermostat with night time setback control. The recommended thermostat set-points for heating and cooling are as follows:

Occupied heating = 70° F / Occupied cooling = 74° F

Unoccupied heating = 60° F / Unoccupied cooling = 85° F

CEG recommends replacement of the existing remote thermostats with Honeywell RTH7500D 7-day programmable thermostat or equivalent.

ECM –PO-2: Programmable Thermostat

Description:

Each Bard air conditioning/heating unit has a standard, manual wall mounted thermostat. These indoor temperature controls are inaccurate due to temperature drift. These units also do not have unoccupied setback features.

New programmable thermostats are available that utilize programming schedules for occupied and unoccupied times and can be set to vary space temperature at these respective times. In addition, the programmable thermostats can be used in conjunction with a motion sensor. When the space is not occupied the equipment can operate at the unoccupied set-point. Once the space becomes occupied the motion sensor sends a signal to the thermostat to raise the temperature of the space to the occupied set-point. This control system approach is ideal for facilities with intermittent occupancy.

This energy conservation measure would replace the various HVAC unit thermostats with a programmable 7-day thermostat with night time setback control. The recommended thermostat set-points for heating and cooling are as follows:

Occupied heating = 70° F / Occupied cooling = 74° F

Unoccupied heating = 60° F / Unoccupied cooling = 85° F

CEG recommends replacement of the existing remote thermostats with Honeywell RTH7500D 7-day programmable thermostat or equivalent.

ECM –UB-1: Programmable Thermostat

Description:

There is one standard, manual wall thermostat for the 4 ton furnace which provides heating and cooling. These aged, indoor temperature controls are inaccurate due to temperature drift, age, and not having been re-calibrated. These units also do not have unoccupied setback features.

New programmable thermostats are available that utilize programming schedules for occupied and unoccupied times and can be set to vary space temperature at these respective times. In addition, the programmable thermostats can be used in conjunction with a motion sensor. When the space is not occupied the equipment can operate at the unoccupied setpoint. Once the space becomes occupied the motion sensor sends a signal to the thermostat to raise the temperature of the space to the occupied setpoint. This control system approach is ideal for facilities with intermittent occupancy.

This energy conservation measure would replace the various HVAC unit thermostat with a programmable 7-day thermostat with night time setback control. The recommended thermostat setpoints for heating and cooling are as follows:

Occupied heating = 70° F
Occupied cooling = 74° F
Unoccupied heating = 60° F
Unoccupied cooling = 85° F

CEG recommends replacement of the existing remote thermostats with Honeywell RTH7500D 7-day programmable thermostat or equivalent.

ECM –AB-6: Programmable Thermostat

Description:

Throughout the building there are standard, manual wall thermostats for the finned tube radiation that provide local control with adjustable settings. These aged, indoor temperature controls are inaccurate due to temperature drift, age, and not having been re-calibrated. These units also do not have unoccupied setback features.

New programmable thermostats are available that utilize programming schedules for occupied and unoccupied times and can be set to vary space temperature at these respective times. In addition, the programmable thermostats can be used in conjunction with a motion sensor. When the space is not occupied the equipment can operate at the unoccupied set-point. Once the space becomes occupied the motion sensor sends a signal to the thermostat to raise the temperature of the space to the occupied set-point. This control system approach is ideal for facilities with intermittent occupancy.

This energy conservation measure would replace the various HVAC unit thermostats with programmable 7-day thermostats with night time setback control. The recommended thermostat set-points for heating are as follows:

Occupied Heating = 70° F
Unoccupied Heating = 60° F

CEG recommends replacement of the existing remote thermostats with Honeywell RTH7500D 7-day programmable thermostat or equivalent.

ECM –MB-7: Retro-Commissioning

Description:

Retro-commissioning is a quality-oriented process for verifying and documenting that HVAC systems perform as closely as possible to defined performance criteria. The benefits include documenting accurately the existing system's function and performance; Verifying that system performance meets the facility's requirements; benchmarking the performance of existing systems for future changes; and identifying problems in the system.

The cost of retro-commissioning of this facility is between $0.15 and $0.30 per Square Foot (Source: Thorne & Nadel "Retro-Commissioning: Program Strategies To Capture Energy Savings in Existing Buildings (2003)" – average Retro-Commissioning costs of $0.22 in TX, TN, CO, MA, AZ, OR, CA).

The energy savings from retro-commissioning critical systems such as HVAC and power systems is approximately 5% of the total energy used (Source: E. Mills et al, "Cost-effectiveness of Commissioning 224 Buildings across 21 states – 2004").

ECM-PG-7: Retro-Commissioning

Description:

Retro-commissioning is a quality-oriented process for verifying and documenting that HVAC systems perform as closely as possible to defined performance criteria. The benefits include documenting accurately the existing system's function and performance; Verifying that system performance meets the facility's requirements; benchmarking the performance of existing systems for future changes; and identifying problems in the system.

The cost of retro-commissioning of the public works facility is between $0.15 and $0.30 per Square Foot (Source: Thorne & Nadel "Retro-Commissioning: Program Strategies To Capture Energy Savings in Existing Buildings (2003)" – average Retro-Commissioning costs of $0.22 in TX, TN, CO, MA, AZ, OR, CA).

The energy savings from retro-commissioning critical systems such as HVAC and power systems is approximately 5% of the total energy used (Source: E. Mills et al, "Cost-effectiveness of Commissioning 224 Buildings across 21 states – 2004").

ECM –PR-5: Retro-Commissioning

Description:

Retro-commissioning is a quality-oriented process for verifying and documenting that HVAC systems perform as closely as possible to defined performance criteria. The benefits include

documenting accurately the existing system's function and performance; Verifying that system performance meets the facility's requirements; benchmarking the performance of existing systems for future changes; and identifying problems in the system.

The cost of retro-commissioning of this facility is between $0.15 and $0.30 per Square Foot (Source: Thorne & Nadel "Retro-Commissioning: Program Strategies To Capture Energy Savings in Existing Buildings (2003)" – average Retro-Commissioning costs of $0.22 in TX, TN, CO, MA, AZ, OR, CA).

The energy savings from retro-commissioning critical systems such as HVAC and power systems is approximately 5% of the total energy used (Source: E. Mills et al, "Cost-effectiveness of Commissioning 224 Buildings across 21 states – 2004").

ECM –SC-8: Retro-Commissioning

Description:

Retro-commissioning is a quality-oriented process for verifying and documenting that HVAC systems perform as closely as possible to defined performance criteria. The benefits include documenting accurately the existing system's function and performance; Verifying that system performance meets the facility's requirements; benchmarking the performance of existing systems for future changes; and identifying problems in the system.

The cost of retro-commissioning of the public works facility is between $0.15 and $0.30 per Square Foot (Source: Thorne & Nadel "Retro-Commissioning: Program Strategies To Capture Energy Savings in Existing Buildings (2003)" – average Retro-Commissioning costs of $0.22 in TX, TN, CO, MA, AZ, OR, CA).

The energy savings from retro-commissioning critical systems such as HVAC and power systems is approximately 5% of the total energy used (Source: E. Mills et al, "Cost-effectiveness of Commissioning 224 Buildings across 21 states – 2004").

ECM –AB-8: Retro-Commissioning

Description:

Retro-commissioning is a quality-oriented process for verifying and documenting that HVAC systems perform as closely as possible to defined performance criteria. The benefits include documenting accurately the existing system's function and performance; Verifying that system performance meets the facility's requirements; benchmarking the performance of existing systems for future changes; and identifying problems in the system.

The cost of retro-commissioning of the public works facility is between $0.15 and $0.30 per Square Foot (Source: Thorne & Nadel "Retro-Commissioning: Program Strategies To Capture

Energy Savings in Existing Buildings (2003)" – average Retro-Commissioning costs of $0.22 in TX, TN, CO, MA, AZ, OR, CA).

The energy savings from retro-commissioning critical systems such as HVAC and power systems is approximately 5% of the total energy used (Source: E. Mills et al, "Cost-effectiveness of Commissioning 224 Buildings across 21 states – 2004").

PHASE II

The second phase involves lightings retrofits and lighting controls at the Annex Building, Municipal Building, Public Works Garage, Public Works Office, Public Works Garage, Police Records Building, Road Building, Senior Center, and Utility Building. The lighting projects require a higher investment by the township; however generally these projects show immediate savings.

ECM –AB-1: Lighting Upgrade - Upgrade the Fluorescent Lighting

Description:

Improved fluorescent lamps and ballasts are available as direct replacements for the existing lamps and ballasts in the Annex Building. A simple retrofit of the existing fixture can provide substantial savings. A conventional drop-ceiling lay in fixture with four, 4-foot lamps has a total wattage of 154 Watts per fixture. By using the improved lamps and ballasts, the total wattage would be reduced to 96 Watts. The light levels would increase by about 15% and the light quality would increase by 35%.

CEG recommends replacement of the existing T12 lamps and ballasts with the latest technology T8 lamps and high efficiency electronic ballasts. The new energy efficient, T8 lamps will provide adequate lighting and will save the Owner on electrical costs due to the better performance of the electronic ballasts. In addition to functional cost savings, the fixture replacement will also provide operational cost savings. The operational cost savings will be realized through the lesser number of lamps that will be required to be replaced per year. The expected lamp life of the latest high efficiency T8 lamps is approximately 30,000 burn-hours, requiring fewer lamps to replace per year. Based on the operating hours of this portion of the facility, approximately 1000-2500 hours per year, the Owner will be changing approximately 33% less lamps per year.

In addition, a single electronic ballast can operate one, two, three, or four lamps in a fixture. The existing magnetic ballasts can only operate up to two lamps. The electronic ballasts could reduce the amount of ballasts in the facility by half. This can be taken advantage of with "tandem wiring" of ballasts. Instead of using one electronic ballast for every <u>one</u> fixture it is sometimes feasible to use <u>one</u> electronic ballast for every <u>two or more</u> fixtures. The electrician wires a single ballast to operate the lamps in adjacent light fixtures which further reduces the amount of ballasts needed.

ECM-AB-2: Lighting Upgrade – Install Compact Fluorescent Lighting

Description:

Compact fluorescent lamps (CFL's) were created to be direct replacements for the standard incandescent lamps which are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to resemble the incandescent lamp. The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light.

The CFL is available in a myriad of shapes and sizes depending on the specific application. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 25-Watt CFL for a 100-Watt incandescent lamp.

The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. CFL's are also available in 3000K, 3500K, and 4100K. The 4100K would be the "brightest" or "coolest" output.

A CFL can be chosen to screw right into existing fixtures, or hardwired into existing fixtures.

ECM-AB-3: Lighting Upgrade – Install Lighting Controls

Description:

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

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

To determine an estimated savings for lighting controls, we used ASHRAE 90.1-2004 (NJ Energy Code). Appendix G states that occupancy sensors have a 10% power adjustment factor for daytime occupancies for buildings over 5,000 SF. CEG recommends the installation of dual

technology occupancy sensors in all private offices, conference rooms, mechanical rooms, storage rooms, file rooms, etc.

CEG would recommend wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications as manufactured by Sensorswitch, Watt Stopper, etc.

ECM –MB-1: Lighting Upgrade - Upgrade the Fluorescent Lighting

Description:

Improved fluorescent lamps and ballasts are available as direct replacements for the existing lamps and ballasts. A simple retrofit of the existing fixture can provide substantial savings. A conventional drop-ceiling lay in fixture with four, 4-foot lamps has a total wattage of 156 Watts per fixture. By using the improved lamps and ballasts, the total wattage would be reduced to 72 Watts. The light levels would increase by about 15% and the light quality would increase by 35%.

CEG recommends replacement of the existing T12 lamps and ballasts with the latest technology T8 lamps and high efficiency electronic ballasts. The new energy efficient, T8 lamps will provide adequate lighting and will save the Owner on electrical costs due to the better performance of the electronic ballasts. In addition to functional cost savings, the fixture replacement will also provide operational cost savings. The operational cost savings will be realized through the lesser number of lamps that will be required to be replaced per year. The expected lamp life of the latest high efficiency T8 lamps is approximately 30,000 burn-hours, requiring fewer lamps to replace per year. Based on the operating hours of this portion of the facility, approximately 3000 hours per year, the Owner will be changing approximately 33% less lamps per year.

In addition, a single electronic ballast can operate one, two, three, or four lamps in a fixture. The existing magnetic ballasts can only operate up to two lamps. The electronic ballasts could reduce the amount of ballasts in the facility by half. This can be taken advantage of with “tandem wiring” of ballasts. Instead of using one electronic ballast for every <u>one</u> fixture it is sometimes feasible to use <u>one</u> electronic ballast for every <u>two or more</u> fixtures. The electrician wires a single ballast to operate the lamps in adjacent light fixtures which further reduces the amount of ballasts needed.

ECM –MB-2: Lighting Upgrade – Install Compact Fluorescent Lighting

Description:

Compact fluorescent lamps (CFL’s) were created to be direct replacements for the standard incandescent lamps which are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to resemble the incandescent lamp.

The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light.

The CFL is available in a myriad of shapes and sizes depending on the specific application. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 25-Watt CFL for a 100-Watt incandescent lamp.

The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. CFL's are also available in 3000K, 3500K, and 4100K. The 4100K would be the "brightest" or "coolest" output.

A CFL can be chosen to screw right into existing fixtures, or hardwired into existing fixtures.

ECM-PG-1: Lighting Upgrade - Upgrade the Fluorescent Lighting

Description:

Improved fluorescent lamps and ballasts are available as direct replacements for the existing lamps and ballasts. A simple retrofit of the existing fixture can provide substantial savings. A conventional drop-ceiling lay in fixture with four, 4-foot lamps has a total wattage of 154 Watts per fixture. By using the improved lamps and ballasts, the total wattage would be reduced to 96 Watts. The light levels would increase by about 15% and the light quality would increase by 35%.

CEG recommends replacement of the existing T12 lamps and ballasts with the latest technology T8 lamps and high efficiency electronic ballasts. The new energy efficient, T8 lamps will provide adequate lighting and will save the Owner on electrical costs due to the better performance of the electronic ballasts. In addition to functional cost savings, the fixture replacement will also provide operational cost savings. The operational cost savings will be realized through the lesser number of lamps that will be required to be replaced per year. The expected lamp life of the latest high efficiency T8 lamps is approximately 30,000 burn-hours, requiring fewer lamps to replace per year. Based on the operating hours of this portion of the facility, approximately 1500-3000 hours per year, the Owner will be changing approximately 33% less lamps per year.

In addition, a single electronic ballast can operate one, two, three, or four lamps in a fixture. The existing magnetic ballasts can only operate up to two lamps. The electronic ballasts could reduce the amount of ballasts in the facility by half. This can be taken advantage of with "tandem wiring" of ballasts. Instead of using one electronic ballast for every <u>one</u> fixture it is sometimes feasible to use <u>one</u> electronic ballast for every <u>two or more</u> fixtures. The electrician wires a single ballast to operate the lamps in adjacent light fixtures which further reduces the amount of ballasts needed.

ECM-PG-2 Lighting Upgrade – Install Compact Fluorescent Lighting

Description:

Compact fluorescent lamps (CFL's) were created to be direct replacements for the standard incandescent lamps which are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to resemble the incandescent lamp. The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light.

The CFL is available in a myriad of shapes and sizes depending on the specific application. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 25-Watt CFL for a 100-Watt incandescent lamp.

The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. CFL's are also available in 3000K, 3500K, and 4100K. The 4100K would be the "brightest" or "coolest" output.

A CFL can be chosen to screw right into existing fixtures, or hardwired into existing fixtures.

ECM-PG-3: Lighting Upgrade – Install Lighting Controls

Description:

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

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

To determine an estimated savings for lighting controls, we used ASHRAE 90.1-2004 (NJ Energy Code). Appendix G states that occupancy sensors have a 10% power adjustment factor for daytime occupancies for buildings over 5,000 SF. CEG recommends the installation of dual

technology occupancy sensors in all private offices, conference rooms, mechanical rooms, storage rooms, file rooms, etc.

CEG would recommend wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications as manufactured by Sensorswitch, Watt Stopper, etc.

ECM –PO-1: Lighting Upgrade – Install Lighting Controls

Description:

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

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

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

CEG would recommend wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications as manufactured by Sensorswitch, Watt Stopper, etc.

ECM –PR-1: Lighting Upgrade - Upgrade the Fluorescent Lighting

Description:

Improved fluorescent lamps and ballasts are available as direct replacements for the existing lamps and ballasts. A simple retrofit of the existing fixture can provide substantial savings. A conventional drop-ceiling lay in fixture with four, 4-foot lamps has a total wattage of 154 Watts per fixture. By using the improved lamps and ballasts, the total wattage would be reduced to 96 Watts. The light levels would increase by about 15% and the light quality would increase by 35%.

CEG recommends replacement of the existing T12 lamps and ballasts with the latest technology T8 lamps and high efficiency electronic ballasts. The new energy efficient, T8 lamps will provide adequate lighting and will save the Owner on electrical costs due to the better performance of the electronic ballasts. In addition to functional cost savings, the fixture replacement will also provide operational cost savings. The operational cost savings will be realized through the lesser number of lamps that will be required to be replaced per year. The expected lamp life of the latest high efficiency T8 lamps is approximately 30,000 burn-hours, requiring fewer lamps to replace per year. Based on the operating hours of this portion of the facility, approximately 1500-3000 hours per year, the Owner will be changing approximately 33% less lamps per year.

In addition, a single electronic ballast can operate one, two, three, or four lamps in a fixture. The existing magnetic ballasts can only operate up to two lamps. The electronic ballasts could reduce the amount of ballasts in the facility by half. This can be taken advantage of with “tandem wiring” of ballasts. Instead of using one electronic ballast for every <u>one</u> fixture it is sometimes feasible to use <u>one</u> electronic ballast for every <u>two or more</u> fixtures. The electrician wires a single ballast to operate the lamps in adjacent light fixtures which further reduces the amount of ballasts needed.

ECM –PR-2: Lighting Upgrade – Install Compact Fluorescent Lighting

Description:

Compact fluorescent lamps (CFL's) were created to be direct replacements for the standard incandescent lamps which are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to resemble the incandescent lamp. The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light.

The CFL is available in a myriad of shapes and sizes depending on the specific application. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 25-Watt CFL for a 100-Watt incandescent lamp.

The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. CFL's are also available in 3000K, 3500K, and 4100K. The 4100K would be the "brightest" or "coolest" output.

A CFL can be chosen to screw right into existing fixtures, or hardwired into existing fixtures.

ECM –PR-3: Lighting Upgrade – Install Lighting Controls

Description:

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

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

To determine an estimated savings for lighting controls, we used ASHRAE 90.1-2004 (NJ Energy Code). Appendix G states that occupancy sensors have a 10% power adjustment factor for daytime occupancies for buildings over 5,000 SF. CEG recommends the installation of dual

technology occupancy sensors in all private offices, conference rooms, mechanical rooms, storage rooms, file rooms, etc.

CEG would recommend wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications as manufactured by Sensorswitch, Watt Stopper, etc.

ECM –RB-1: Lighting Upgrade - Upgrade the Fluorescent Lighting

Description:

Improved fluorescent lamps and ballasts are available as direct replacements for the existing lamps and ballasts. A simple retrofit of the existing fixture can provide substantial savings. A conventional surface mounted fixture with two, 4-foot lamps has a total wattage of 77 Watts per fixture. By using the improved lamps and ballasts, the total wattage would be reduced to 48 Watts. The light levels would increase by about 15% and the light quality would increase by 35%.

CEG recommends replacement of the existing T12 lamps and ballasts with the latest technology T8 lamps and high efficiency electronic ballasts. The new energy efficient, T8 lamps will provide adequate lighting and will save the Owner on electrical costs due to the better performance of the electronic ballasts. In addition to functional cost savings, the fixture replacement will also provide operational cost savings. The operational cost savings will be realized through the lesser number of lamps that will be required to be replaced per year. The expected lamp life of the latest high efficiency T8 lamps is approximately 30,000 burn-hours, requiring fewer lamps to replace per year. Based on the operating hours of this portion of the facility, approximately 1500 hours per year, the Owner will be changing approximately 33% less lamps per year.

In addition, a single electronic ballast can operate one, two, three, or four lamps in a fixture. The existing magnetic ballasts can only operate up to two lamps. The electronic ballasts could reduce the amount of ballasts in the facility by half. This can be taken advantage of with “tandem wiring” of ballasts. Instead of using one electronic ballast for every <u>one</u> fixture it is sometimes feasible to use <u>one</u> electronic ballast for every <u>two or more</u> fixtures. The electrician wires a single ballast to operate the lamps in adjacent light fixtures which further reduces the amount of ballasts needed.

ECM –RB-2: Lighting Upgrade – Install Compact Fluorescent Lighting

Description:

Compact fluorescent lamps (CFL's) were created to be direct replacements for the standard incandescent lamps which are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to resemble the incandescent lamp. The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light.

The CFL is available in a myriad of shapes and sizes depending on the specific application. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 25-Watt CFL for a 100-Watt incandescent lamp.

The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. CFL's are also available in 3000K, 3500K, and 4100K. The 4100K would be the "brightest" or "coolest" output.

A CFL can be chosen to screw right into existing fixtures, or hardwired into existing fixtures.

ECM –RB-3: Lighting Upgrade – Install Lighting Controls

Description:

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

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

To determine an estimated savings for lighting controls, we used ASHRAE 90.1-2004 (NJ Energy Code). Appendix G states that occupancy sensors have a 10% power adjustment factor for daytime occupancies for buildings over 5,000 SF. CEG recommends the installation of dual

technology occupancy sensors in all private offices, conference rooms, mechanical rooms, storage rooms, file rooms, etc.

CEG would recommend wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications as manufactured by Sensorswitch, Watt Stopper, etc.

ECM –SC-1: Lighting Upgrade - Upgrade the Fluorescent Lighting

Description:

Improved fluorescent lamps and ballasts are available as direct replacements for the existing lamps and ballasts. A simple retrofit of the existing fixture can provide substantial savings. A conventional drop-ceiling lay in fixture with three, 4-foot lamps has a total wattage of 115 Watts per fixture. By using the improved lamps and ballasts, the total wattage would be reduced to 72 Watts. The light levels would increase by about 15% and the light quality would increase by 35%.

CEG recommends replacement of the existing T12 lamps and ballasts with the latest technology T8 lamps and high efficiency electronic ballasts. The new energy efficient, T8 lamps will provide adequate lighting and will save the Owner on electrical costs due to the better performance of the electronic ballasts. In addition to functional cost savings, the fixture replacement will also provide operational cost savings. The operational cost savings will be realized through the lesser number of lamps that will be required to be replaced per year. The expected lamp life of the latest high efficiency T8 lamps is approximately 30,000 burn-hours, requiring fewer lamps to replace per year. Based on the operating hours of this portion of the facility, approximately 1000 hours per year, the Owner will be changing approximately 33% less lamps per year.

In addition, a single electronic ballast can operate one, two, three, or four lamps in a fixture. The existing magnetic ballasts can only operate up to two lamps. The electronic ballasts could reduce the amount of ballasts in the facility by half. This can be taken advantage of with “tandem wiring” of ballasts. Instead of using one electronic ballast for every <u>one</u> fixture it is sometimes feasible to use <u>one</u> electronic ballast for every <u>two or more</u> fixtures. The electrician wires a single ballast to operate the lamps in adjacent light fixtures which further reduces the amount of ballasts needed.

ECM –SC-2: Lighting Upgrade – Install Compact Fluorescent Lighting

Description:

Compact fluorescent lamps (CFL's) were created to be direct replacements for the standard incandescent lamps which are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to resemble the incandescent lamp.

The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light.

The CFL is available in a myriad of shapes and sizes depending on the specific application. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 25-Watt CFL for a 100-Watt incandescent lamp.

The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. CFL's are also available in 3000K, 3500K, and 4100K. The 4100K would be the "brightest" or "coolest" output.

A CFL can be chosen to screw right into existing fixtures, or hardwired into existing fixtures.

ECM –SC-3: Lighting Upgrade – Install Lighting Controls

Description:

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

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

To determine an estimated savings for lighting controls, we used ASHRAE 90.1-2004 (NJ Energy Code). Appendix G states that occupancy sensors have a 10% power adjustment factor for daytime occupancies for buildings over 5,000 SF. CEG recommends the installation of dual

technology occupancy sensors in all private offices, conference rooms, mechanical rooms, storage rooms, file rooms, etc.

CEG would recommend wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications as manufactured by Sensorswitch, Watt Stopper, etc.

ECM –UB-2: Lighting Upgrade – Install Lighting Controls

Description:

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

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

To determine an estimated savings for lighting controls, we used ASHRAE 90.1-2004 (NJ Energy Code). Appendix G states that occupancy sensors have a 10% power adjustment factor for daytime occupancies for buildings over 5,000 SF. CEG recommends the installation of dual technology occupancy sensors in all private offices, conference rooms, mechanical rooms, storage rooms, file rooms, etc.
CEG would recommend wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications as manufactured by Sensorswitch, Watt Stopper, etc.

ECM –MB-3: Lighting Upgrade – Install Lighting Controls

Description:

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

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

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

CEG would recommend wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications as manufactured by Sensorswitch, Watt Stopper, etc.

PHASE III

The third phase of implementation involves refitting of some of the hot water heating and domestic hot water boilers in the Senior Center, Annex Building, Public Works Garage, and Police Records.

ECM –SC-4: Replace Heating Hot Water Boiler

Description:

The Senior Center is heated by a Weil McLain natural gas fired hot water boiler with 390 MBH input and presently is about 79% efficient. The unit was installed in about 1992. The estimated service life for the furnace is 25 years as outlined in Chapter 36 of the 2007 ASHRAE Applications Handbook. In this energy conservation measure we are suggesting replacing the existing boiler with a new Lochinvar Knight XL boiler rated at 399 MBH input and 93.3% efficient.

ECM –SC-7: Domestic Hot Water Heater Replacement

Description:

The electric domestic hot water heater for the building appears to only have about 2 years remaining of useful life. This energy conservation measure will replace the existing electric, 6000 Watt, 60-gallon capacity domestic hot water heater with a gas-fired, tankless water heater. Tankless water heaters heat water directly without the use of a storage tank. Therefore, they avoid the standby heat losses associated with storage water heaters. In a gas-fired tankless water heater, a gas burner heats the water and provides a constant supply of hot water. Therefore, you do not need to wait for the storage tank to fill up with enough hot water as is typical with storage-type hot water heaters.

ECM –AB-5: Domestic Hot Water Heater Replacement

Description:

The existing domestic hot water heater for the building is a 40 gallon, natural gas fired unit with a combustion efficiency of 83%. This energy conservation measure will replace the existing unit with a natural gas-fired, tankless water heater. Tankless water heaters heat water directly without the use of a storage tank. Therefore, they avoid the standby heat losses associated with storage water heaters. In a gas-fired tankless water heater, a gas burner heats the water and provides a constant supply of hot water. Therefore, you do not need to wait for the storage tank to fill up with enough hot water as is typical with storage-type hot water heaters.

ECM-PG-5: Domestic Hot Water Heater Replacement

Description:

The existing electric domestic hot water heater for the building was installed around 1979. This energy conservation measure will replace the existing electric, 4,500 Watt, 50-gallon capacity domestic hot water heater with a gas-fired, tankless water heater. Tankless water heaters heat water directly without the use of a storage tank. Therefore, they avoid the standby heat losses associated with storage water heaters. In a gas-fired tankless water heater, a gas burner heats the water and provides a constant supply of hot water. Therefore, you do not need to wait for the storage tank to fill up with enough hot water as is typical with storage-type hot water heaters.

ECM –PR-4: Domestic Hot Water Heater Replacement

Description:

The electric domestic hot water heater for the building appears to only have about 2 years remaining of useful life. This energy conservation measure will replace the existing electric, 6000 Watt, 60-gallon capacity domestic hot water heater with a gas-fired, tankless water heater. Tankless water heaters heat water directly without the use of a storage tank. Therefore, they avoid the standby heat losses associated with storage water heaters. In a gas-fired tankless water heater, a gas burner heats the water and provides a constant supply of hot water. Therefore, you do not need to wait for the storage tank to fill up with enough hot water as is typical with storage-type hot water heaters.

PHASE IV

The fourth phase of construction involves more mechanical heating and cooling equipment retrofits. Work will be performed at the Senior Center and Municipal Building.

ECM –SC-5: Air Conditioning Upgrade – Social Hall

Description:

Air-conditioning is provided within the Social Hall by two 7 ton split systems units totaling 14 tons of cooling. The indoor fan coil units have hydronic heating coils which provide heating during the winter months. The heating coils are fed from the main heating boiler loop. Each indoor unit's cooling coil is coupled with a 7 ton outdoor condensing unit which provides cooling. The estimated seasonal energy efficiency ratio (SEER) of CU-1 is about 8.0. CU-2 appears to have been replaced approximately 10 years ago with a 10 SEER Rheem unit. The NJ State Energy Code (ASHRAE 90.1-2008) mandates a minimum energy efficiency of 13.0 SEER for units of this type. The remaining service life of the fan coils units is approximately 3 years as outlined in Chapter 36 of the 2007 ASHRAE Applications Handbook. CU-1 is well beyond it's useful life and CU-2 has 10 years of remaining service life.

This energy conservation measure would replace the (2) indoor fan coil units and their associated outdoor condensing units. The existing units will be replaced with high energy efficient, split system air-conditioning units with cooling capacities typical of the existing units. The average SEER of the new equipment will be upwards of 15 SEER.

ECM –SC-6: Air Conditioning Upgrade – Lobby, Vestibule & Office

Description:

Air-conditioning is provided within the Lobby, Vestibule and Office by one 3 ton split system. The indoor fan coil unit has a hydronic heating coil which provides heating during the winter months. The heating coil is fed from the main heating boiler loop. The indoor unit's cooling coil is coupled with a 3 ton outdoor condensing unit which provides cooling. The estimated seasonal energy efficiency ratio (SEER) of CU-3 is about 8.0. The NJ State Energy Code (ASHRAE 90.1-2008) mandates a minimum energy efficiency of 13.0 SEER for units of this type. The remaining service life of the fan coils units is approximately 3 years as outlined in Chapter 36 of the 2007 ASHRAE Applications Handbook. CU-3 is well beyond its useful life.

This energy conservation measure would replace the indoor fan coil unit and its associated outdoor condensing unit. The existing unit will be replaced with high energy efficient, split system air-conditioning units with cooling capacities typical of the existing units. The average SEER of the new equipment will be upwards of 15 SEER.

ECM –MB-4: Replace Heating Hot Water Boiler

Description:

The Municipal Building is heated by a Weil McLain natural gas fired hot water boiler which presently is about 70% efficient. The boiler was installed in 1975. The estimated service life for the furnace is 25 years as outlined in Chapter 36 of the 2007 ASHRAE Applications Handbook. The boiler is coming to the end of its useful service life. The existing boiler also feeds the domestic hot water generator which provides hot water for the building. In this energy conservation measure we are suggesting replacing the existing boiler with a new Lochinvar Intelli-fin rated at 1500 MBH input and 92% efficient (97% part load efficiency).

ECM-MB-5: Replace Domestic Water Generator

Description:

The Municipal Building is heated by a Weil McLain natural gas fired hot water boiler which presently is about 70% efficient. The boiler was installed in 1975. The estimated service life for the furnace is 25 years as outlined in Chapter 36 of the 2007 ASHRAE Applications Handbook. The boiler is coming to the end of it's useful service life. The existing boiler also feeds the domestic hot water generator which provides hot water for the building. In this energy conservation measure we are suggesting replacing the domestic water generator with a new Lochinvar water heater rated at 385 MBH input and 92% efficient (98% part load efficiency). The existing domestic hot water storage tank would remain operational.

PHASE V

The final phase includes the projects with longer term paybacks. These options should be further investigated and compared with the goals of their long range facility planning prior to implementation.

ECM-RB-4: Heating System Upgrade

Description:

Heating for the building is provided by a gas-fired furnace. The existing furnace was installed around 1975 and is 67% efficient at best. The existing furnace is aged and is past its service life as outlined in Chapter 36 of the 2007 ASHRAE Applications Handbook.

This energy conservation measure would replace the furnace. The existing equipment will be replaced with an energy efficient, heating only unit. The existing unit's capacity is 120 MBH input. We estimate that it's slightly oversized and a 90 MBH input unit can be used instead. The combustion efficiency for the new heater will be 94%. The energy efficiency of the new equipment is based on a Lennox G61 gas furnace.

ECM-MB-6: Install Double-Pane Insulating Windows

Description:

The Municipal Building has single-pane windows which allow substantial heat losses and gains resulting in cooler interior surfaces during the heating season and warmer interior surfaces during the cooling season. In addition, these windows are a source of cold air leakage into the building. Finally, single-pane glass may result in condensation-related problems when warm interior air contacts cold surfaces.

High-performance windows can provide many benefits including:

- Improved comfort by reducing radiant heat exchange
- Improved indoor air quality by reducing air leakage that can bring dirt, dust, and other impurities into the building
- Lower utility bills since these windows are better insulated and more air-tight
- Fewer condensation problems since these windows stay warmer in the heating season resulting in drier windows

This energy conservation measure would replace all of the single-pane windows with double-pane, insulating windows.

ECM-PG-4: Air Conditioning System Upgrade– Office & Lockers

Description:

Heating and cooling for the office and the locker rooms is provided by split-system air-conditioning and a gas-fired furnace. The existing furnace was installed in 1975 and is 80% efficient at best. The unit's indoor cooling coil and outdoor condensing unit were replaced within the last 3 years and have an estimated seasonal energy efficiency ratio (SEER) of 13.0. The NJ State Energy Code (ASHRAE 90.1-2004) mandates a minimum energy efficiency of 13.0 SEER for units of this type. The existing furnace is aged and is past its service life as outlined in Chapter 36 of the 2007 ASHRAE Applications Handbook. The estimated service life for split system air-conditioning unit is 15 years.

This energy conservation measure would replace the air handler/furnace, and condensing unit. The existing equipment will be replaced with an energy efficient, split system with heating and cooling capacities equivalent to the existing system. The average EER of the new cooling equipment will be 16.0 EER and the combustion efficiency for heating will be 94%. The energy efficiency of the new equipment is based on a Lennox G61 gas furnace, cased evaporator coil, and model SSB condensing unit.

ECM –AB-7: Install Double-Pane Insulating Windows

Description:

The first floor of the Annex building has single-pane windows which allow substantial heat losses and gains resulting in cooler interior surfaces during the heating season and warmer interior surfaces during the cooling season. In addition, these windows are a source of cold air leakage into the building. Finally, single-pane glass may result in condensation-related problems when warm interior air contacts cold surfaces.

High-performance windows can provide many benefits including:

- Improved comfort by reducing radiant heat exchange
- Improved indoor air quality by reducing air leakage that can bring dirt, dust, and other impurities into the building
- Lower utility bills since these windows are better insulated and more air-tight
- Fewer condensation problems since these windows stay warmer in the heating season resulting in drier windows

This energy conservation measure would replace all of the single-pane windows with double-pane, insulating windows.

ECM –AB-4: Replace Heating Hot Water Boiler

Description:

The Annex is heated by a H. B. Smith natural gas fired hot water boiler which presently is about 83% efficient. The exact date of installation is unknown. The estimated service life for the furnace is 25 years as outlined in Chapter 36 of the 2007 ASHRAE Applications Handbook. In this energy conservation measure we are suggesting replacing the existing boiler with a new Lochinvar Knight boiler rated at 226 MBH and 96% efficient.

VII. SOLAR PHOTOVOLTAIC MEASURES

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

Three Township Facilities are viable for the installation of solar and they are: the Municipal Building, Public Works Garage, and Senior Center. These buildings can accommodate PV system sizes of approximately 170 kilowatts, 50 kilowatts, and 40 kilowatts, respectively. The estimated total cost to install the three PV systems would be approximately $2,382,570 with a total savings (including electrical production and Solar Renewable Energy Credits) totaling approximately $207,074 per year. This would provide an estimated total simple payback of 11.5 years. The overall cost for installation of the PV systems requires a large capital investment by the Township and it is recommended the Township phase the installation of these systems into their capital budget over multiple years if they wish to self fund the systems.

Currently, the Township has moved forward in its renewable objectives and is installing a 44.2 kilowatt PV system at its Senior Center. This PV system will be capable of providing enough electric energy production to account for nearly all of the Senior Center's electric consumption. CEG recommends the Township utilize this installation as a pilot project and then schedule the future installations based on the success of the Senior Center PV system.

VIII. GREENHOUSE GAS REDUCTION COMMITMENT

The Township of Winslow has instituted a commitment to the reduction of greenhouse gases within the Township. By making this commitment a primary effort, the Township is indicating their desire to move forward in an energy conscience path for their existing operations and facilities and future endeavors. The Township "baseline" and "revised" carbon footprint will be noted in the sub-sections below. The "baseline" carbon footprint will indicate the current state of the Township's energy usage as it pertains to carbon production and the "revised" carbon footprint will calculate the estimated future decrease in carbon production based on the implementation of the recommended energy conservation and renewable measures. Also, indicated in the calculations will be the estimated number of cars removed from the road and the estimated number of trees that could be planted by the reduction of carbon emissions.

The following are general factors utilized in performing the calculations:

- *Power Plant CO2 Production*: Electricity is delivered to the Township from the grid by the PJM interconnection, which is a regional transmission organization. Based on information published by EPA, the carbon generation average equals approximately 1.583 lbs / KWH and has a natural gas combustion average of 11.023 lbs / therm (HHV).

- *Vehicle CO2 Production*: The Environmental Protection Agency (EPA) estimates that one car emits 11, 560 pounds of CO2 per year. CO2 emissions published by the EPA for Gasoline are 19.4 pounds per gallon and for diesel 22.2 pounds per gallon.

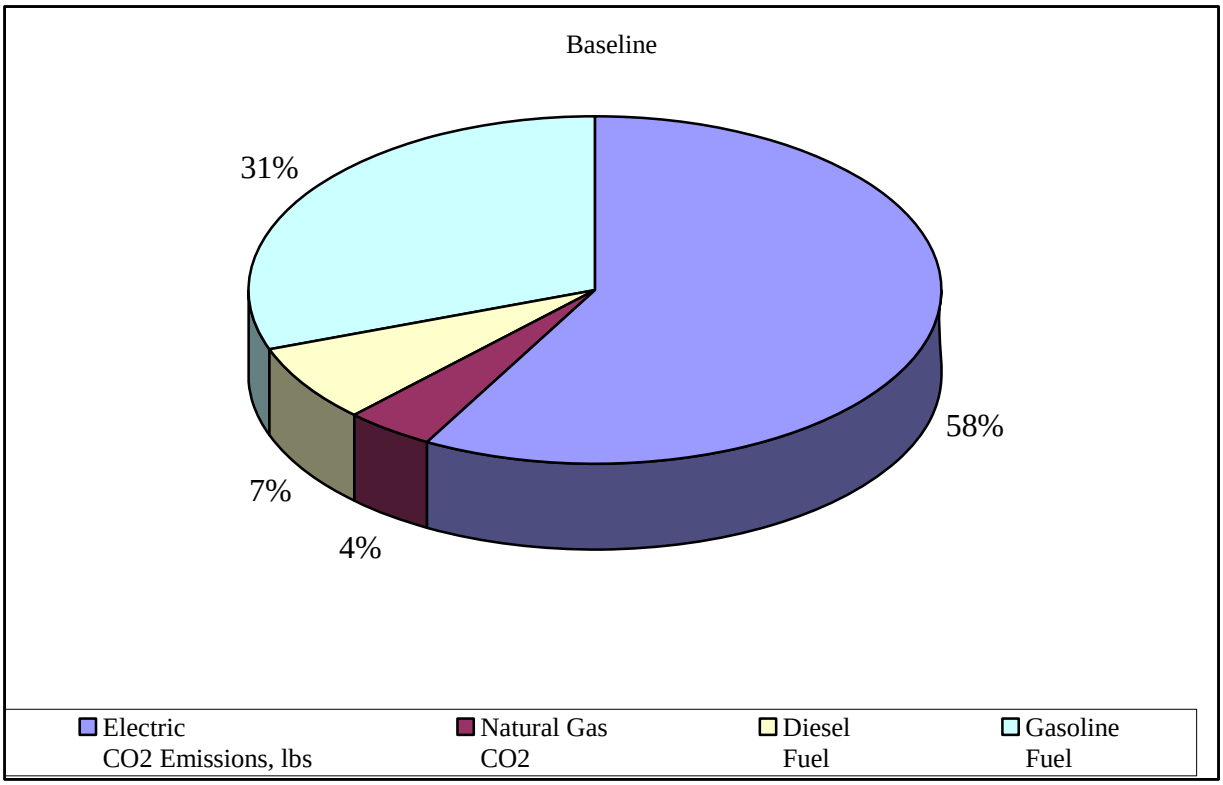
- *Estimated Trees Planted*: The Environmental Protection Agency (EPA) estimates that reducing CO2 emissions by 7,333 pounds is equivalent to planting an acre of trees.

A. TOWNSHIP BASELINE CARBON FOOTPRINT

Based on the utility information gathered in previous sections of this report, the following is a table delineating the "baseline" carbon footprint for the Township of Winslow:

Table 7: Township Baseline Carbon Footprint

BASELINE CARBON FOOTPRINT					
Description	**Electric CO_2 Emissions, lbs**	**Natural Gas CO_2 , lbs**	**Diesel Fuel CO_2 , lbs**	**Gasoline Fuel CO_2 , lbs**	**Total CO_2 Emissions, lbs**
Baseline	4,809,310	355,440	585,125	2,542,506	**8,292,382**



B. TOWNSHIP REVISED CARBON FOOTPRINT

Based on the recommended energy conservation measures noted in previous sections of this report, the following is a table delineating the "revised" carbon footprint for the Township of Winslow:

Table 8: Township Revised Carbon Footprint

POST MEASURES CARBON FOOTPRINT					
Description	**Electric CO_2 Emissions, lbs**	**Natural Gas CO_2 , lbs**	**Diesel Fuel CO_2 , lbs**	**Gasoline Fuel CO_2 , lbs**	**Total CO_2 Emissions, lbs**
Post Measures	4,533,190	216,528	585,125	2,542,506	**7,877,348**

IX. INSTALLATION FUNDING OPTIONS

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

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

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

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

iv. *Pay For Performance* – The New Jersey Smart Start Pay for Performance program includes incentives based on savings resulted from implemented ECMs. The program is available for all buildings audited as part of the NJ Clean Energy Program's Local Government Energy Audit Program. The facility's participation in the program is assisted by an approved program partner. An "Energy Reduction Plan" is created with the facility and approved partner to shown at least 15% reduction in the building's current energy use. Multiple energy conservation measures implemented together are applicable toward the total savings of at least 15%. No more than 50% of the total energy savings can result from lighting upgrades / changes.

Total incentive is capped at 50% of the project cost. The program savings is broken down into three benchmarks; Energy Reduction Plan, Project Implementation, and Measurement and Verification. Each step provides additional incentives as the energy reduction project continues. The benchmark incentives are as follows:

1. Energy Reduction Plan – Upon completion of an energy reduction plan by an approved program partner, the incentive will grant $0.10 per square foot between $5,000 and $50,000, and not to exceed 50% of the facility's annual energy expense. (Benchmark #1 is not provided in addition to the local government energy audit program incentive.)

2. Project Implementation – Upon installation of the recommended measures along with the "Substantial Completion Construction Report," the incentive will grant savings per KWH or Therm based on the program's rates. Minimum saving must be 15%. (Example $0.11 / kWh for 15% savings, $0.12/ kWh for 17% savings, … and $1.10 / Therm for 15% savings, $1.20 / Therm for 17% saving, …) Increased incentives result from projected savings above 15%.

3. Measurement and Verification – Upon verification 12 months after implementation of all recommended measures, that actual savings have been achieved, based on a completed verification report, the incentive will grant additional savings per kWh or Therm based on the program's rates. Minimum savings must be 15%. (Example $0.07 / kWh for 15% savings, $0.08/ kWh for 17% savings, … and $0.70 / Therm for 15% savings, $0.80 / Therm for 17% saving, …) Increased incentives result from verified savings above 15%.

v. *Direct Install Program* – The New Jersey Clean Energy's Direct Install Program is a state funded program that targets small commercial and industrial facilities with peak demand of less than 200 kW. This turnkey program is aimed at providing owners a seamless, comprehensive process for analysis, equipment replacement and financial incentives to reduce consumption, lower utility costs and improve profitability. The program covers up to 80% of the cost for eligible upgrades including lighting, lighting controls, refrigeration, HVAC, motors, variable speed drives, natural gas and food service. Participating contractors (refer to www.njcleanenergy.com) conduct energy assessments in addition to your standard local government energy audit and install the cost-effective measures.

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

X. PRELIMINARY MEASUREMENT AND VERIFICATION PLAN

The primary purpose of Measurement and Verification (M&V) is to validate performance of energy efficiency upgrades and payments made towards these upgrades. M&V should not be used to derive a precise energy savings for every project, but to assess whether or not the properly installed projects are reasonable close to the projected savings. Careful consideration should be taken in selecting an M&V plan based on risk and cost benefit to the Township for the proposed projects. The U.S. Department of Energy has produced and published Measurement and Verification Guidelines for Federal Energy Projects. These guidelines have been used as a base reference for this report and a full copy of the U.S. DOE guidelines are available at www.eere.energy.gov/femp.

The following table outlines the four most common approaches for Measurement and Verification.

Table 8: Measurement and Verification Approach

MEASUREMENT AND VERIFICATION APPROACH		
M&V OPTION	**PERFORMANCE & USAGE FACTORS MEASUREMENTS**	**SAVINGS CALCULATION METHODOLOGY**
Option A – Retrofit Isolation with Key Parameter Measurement	This option is based on a combination of measured and estimated factors when variations in factors are not expected. Measurements are spot or short-term and are taken at the component or system level, both in the baseline and post-installation cases. Measurements should include the key performance parameter(s) which define the energy use of the ECM. Estimated factors are supported by historical or manufacturer's data. Savings are determined by means of engineering calculations of baseline and post-installation energy use based on measured and estimated values.	Direct measurements and estimated values, engineering calculations and/or component or system models often developed through regression analysis Adjustments to models are not typically required.
Option B – Retrofit Isolation with All Parameter Measurement	This option is based on periodic or continuous measurements of energy use taken at the component or system level when variations in factors are expected. Energy or proxies of energy use are measured continuously. Periodic spot or short-term measurements may suffice when variations in factors are not expected. Savings are determined from analysis of baseline and reporting period energy use or proxies of energy use.	Direct measurements, engineering calculations, and/or component or system models often developed through regression analysis Adjustments to models may be required.

Option C – Utility Data Analysis	This option is based on long-term, continuous, whole-building utility meter, facility level, or sub-meter energy (or water) data. Savings are determined from analysis of baseline and reporting period energy data. Typically, regression analysis is conducted to correlate with and adjust energy use to independent variables such as weather, but simple comparisons may also be used.	Based on regression analysis of utility meter data to account for factors that drive energy use Adjustments to models are typically required.
Option D – Calibrated Computer Simulation	Computer simulation software is used to model energy performance of a whole-facility (or sub-facility). Models must be calibrated with actual hourly or monthly billing data from the facility. Implementation of simulation modeling requires engineering expertise. Inputs to the model include facility characteristics; performance specifications of new and existing equipment or systems; engineering estimates, spot-, short-term, or long-term measurements of system components; and long-term whole-building utility meter data. After the model has been calibrated, savings are determined by comparing a simulation of the baseline with either a simulation of the performance period or actual utility data.	Based on computer simulation model (such as eQUEST or Trane Trace 700) calibrated with whole-building or end-use metered data or both. Adjustments to models are required.

Each of the above approaches can be used for a wide array of energy efficiency upgrades, and each has different costs and complexities associated with it. When selecting an M&V approach the following general rules of thumb can be applied.

- **Option A** - Retrofit Isolation with Key Parameter Measurement
  - When magnitude of savings is low for the entire project or a portion of the project.
  - The risk for not achieving savings is low.
- **Option B** - Retrofit Isolation with All Parameter Measurement
  - For simple equipment replacement projects.
  - When energy savings values per individual measure are desired.
  - When interactive effects are to be ignored or are estimated using estimating methods that do not involve long term measurements.
  - When independent variables that affect energy use are not complex and excessively difficult or expensive to monitor.
  - When sub meters already existing that record the energy use of subsystems under consideration.

- **Option C** - Utility Data Analysis

  - For complex equipment replacement and controls projects.
  - When predicted energy savings are in excess of 10 to 20 percent as compared with the record energy use.
  - When energy savings per individual measure are not desired.
  - When interactive effects are to be included.
  - When the independent variables that affect energy use are complex and excessively difficult or expensive to monitor.

- **Option D** - Calibrated Computer Simulation

  - When new construction projects are involved.
  - When energy savings values per measure are desired.
  - When Option C tools cannot cost effectively evaluate particular measures or their interactions with the building.
  - When complex baseline adjustments are anticipated.

Overall, Measurement and Verification is the key to realizing actual savings from the implementation of any energy conservation measure or renewable energy measure. Combined with a detailed construction management plan, the Owner will be able to benefit fully from the energy and cost savings associated with their commitment to saving energy and reducing greenhouse gases. **Table 9** below provides alternatives for which M&V protocol option the Township should consider each measure.

Table 9 Measurement & Verification Options

MEASUREMENT AND VERIFICATION PLAN				
M&V OPTION	**OPTION A**	**OPTION B**	**OPTION C**	**OPTION D**
PHASE I				
ECM-PG-6			X	
ECM-PO-2			X	
ECM-UB-1			X	
ECM-AB-6			X	
ECM-MB-7			X	
ECM-PG-7			X	
ECM-PR-5			X	
ECM-SC-8			X	
ECM-AB-8			X	
PHASE II				
ECM-AB-1	X	X		
ECM-AB-2	X	X		
ECM-AB-3		X	X	
ECM-MB-1	X	X		
ECM-MB-2	X	X		
ECM-MB-3		X	X	
ECM-PG-1	X	X		
ECM-PG-2	X	X		
ECM-PG-3		X	X	
ECM-PO-1		X	X	
ECM-PR-1	X	X		
ECM-PR-2	X	X		
ECM-PR-3		X	X	
ECM-RB-1	X	X		
ECM-RB-2	X	X		
ECM-RB-3		X	X	
ECM-SC-1	X	X		
ECM-SC-2	X	X		
ECM-SC-3		X	X	
ECM-UB-2		X	X	
PHASE III				
ECM-SC-4			X	X
ECM-SC-7		X	X	
ECM-AB-5		X	X	
ECM-PG-5		X	X	
ECM-PR-4		X	X	
PHASE IV				
ECM-SC-5			X	X
ECM-SC-6			X	X
ECM-MB-4			X	X
ECM-MB-5			X	X
PHASE V				
ECM-RB-4			X	X
ECM-MB-6			X	
ECM-PG-4			X	X
ECM-AB-7			X	
ECM-AB-4			X	X

XI. LEED® / ENERGY EFFICIENCY DESIGN STANDARDS

The Township of Winslow is making a great stride in energy efficiency and sustainable design by implementing LEED® / Energy Efficiency Design Standards for new construction, renovation and additions within the Township. By utilizing sustainable design standards, the Township is attempting to eliminate negative environmental impact from their facilities by taking into consideration all aspects that define a building structure, its performance and lifetime maintenance. Overall, the goal of creating an energy efficiency and sustainable design standard is to conserve energy which will lessen the Township's environmental impact by implementing standards that utilize sustainable concepts. By utilizing the LEED® rating systems and standards the Township will look to reduce the overall impact of the built environment on human health and the natural environment by efficiently using energy, water and other resources, protecting occupant health and improving employee productivity, and reducing waste, pollution and environmental degradation. The following information will be utilized for consideration when completing any new construction, renovation and additions within the Township:

A. DESIGN CODES AND STANDARDS

In accordance with the construction codes of the State of New Jersey, the following codes and standards shall be adhered to during the planning, engineering and construction phases:

- **Applicable Codes**

  - State of New Jersey Uniform Construction Code (NJUCC)
  - Building Code: International Building Code/2006 as amended by the NJUCC
  - Electrical Code: National Electrical Code (NEC®)/2005 as amended by the NJUCC
  - Mechanical Code: International Mechanical Code/2006 as amended by the NJUCC
  - Plumbing Code: The National Standard Plumbing Code/2006 as amended by the NJUCC
  - N.J.A.C. 5:23-7 Barrier Free Subcode
  - CABO/ANSI A117.1/2003 as amended by the NJUCC

- **HVAC Codes and Standards**

  - International Fuel Gas Code/2006 as amended by the NJUCC
  - ASHRAE / IESNA Standard 90.1-2004, Energy Efficient Design of New Buildings except Low-Rise Residential Buildings
  - ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality
  - ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy
  - ANSI / ASA Standard S12.6-2002, Acoustical Performance Criteria, Design Requirements and Guidelines (For Reference Only)
  - Guidelines for Occupied Buildings under Construction, 1995, Chapter 3
  - SMACNA Duct Construction Standards, (Commercial and Industrial)

- ASHRAE Guideline 1-1996: The HVAC Commissioning Process
- ASHRAE Guideline 4 – 1993: Preparation of Operations and Maintenance Documentation for Building Systems

➢ **Electrical Codes and Standards**

- Underwriters Laboratories (UL)
- Institute of Electrical & Electronics Engineers (IEEE)
- National Electrical Manufacturers Association (NEMA)
- American National Standards Institute (ANSI)
- ASHRAE / IESNA Standard 90.1-2004, Energy Efficient Design of New Buildings except Low-Rise Residential Buildings

➢ **Plumbing Codes and Standards**

- National Standard Plumbing Code 2006
- Energy Policy Act of 1992 plumbing fixture performance requirements

➢ **Life Safety Codes and Standards**

- NFPA 13 - 2006: Installation of Sprinkler Systems
- NFPA 14 - 2006: Standpipe and Hose Systems
- NFPA 20 - 2006: Centrifugal Fire Pump Systems
- NFPA 24 - 2006: Installation of Private Fire Service Mains
- NFPA 72 - 2006: National Fire Alarm Code
- Factory Mutual Data Sheet 2-8N-2001: Installation of Sprinkler Systems
- Underwriters Laboratories, Inc. (UL)

B. BUILDING CONSTRUCTION

The building construction whether it be new construction or an existing facility is key to developing and creating an energy efficient and sustainable facility. The building construction shall be designed in accordance to all mandated building codes and design standards noted above in addition to meeting the minimum insulative properties noted in the New Jersey Energy Code, ASHRAE 90.1-2004.

C. HVAC SYSTEMS

The heating, ventilating and air-conditioning (HVAC) systems shall be designed in accordance with the mandated building codes and design standards noted above. In addition, to the noted codes and standards the following shall be highlighted for each HVAC design:

- High Performance, Energy Efficient HVAC System Selection
- Thermal Comfort and Control via Direct Digital Control (DDC) Systems
- Energy Recovery Systems for High Volume, Outdoor Air Systems

- CO2 Monitoring to Control Outdoor Air Volume and Quality in High Volume, Varied Occupancy Spaces
- Utilization of Geothermal Technologies (where applicable)

D. LIGHTING SYSTEMS

The lighting systems shall be designed in accordance with the mandated building codes and design standards noted above. In addition to the noted codes and standards the following shall be highlighted for each lighting system design:

- High Performance, Energy Efficient Lighting Layout
- Utilization of Occupancy Controls
- Utilization of Daylighting and Daylighting Controls
- Conformance of Lighting Levels with the Illuminating Engineering Society of North America (IESNA)
- Conformance of Lighting Power Densities (Watt per SF) in accordance with ASHRAE 90.1-2004

E. PLUMBING SYSTEMS

The plumbing systems shall be designed in accordance with the mandated building codes and design standards noted above. In addition to the noted codes and standards the following shall be highlighted for each plumbing system design:

- High Performance, Energy Efficient Domestic Hot Water Heater (Tankless and Storage Type)
- Utilization of Waterless Urinals (where applicable)
- Utilization of Low-Flow or Dual Flush Toilets
- Utilization of Sensor Activated Faucets and Sensor Activated Flushometer for Toilets and Urinals
- ADA Compliancy

F. LEED® RATING SYSTEMS

LEED® rating systems and design guidelines will be utilized for all facilities in order to maintain the sustainable design concepts and ideals the Township wishes to implement for new construction, renovations and additions projects. LEED® is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. The LEED® process was developed by the U.S. Green Building Council (USGBC) and provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design,

construction, operations and maintenance solutions. The following are topics that will require consideration on future projects within the Township:

- **Sustainable Sites**
  - Concentration on the project site, construction activity pollution limitations, alternative transportation, low-emitting and fuel efficient vehicles and light pollution reduction will be conducted in addition to other requirements of this section.
- **Water Efficiency**
  - Concentration on water use reduction, water efficient landscaping, and innovative wastewater technologies will be conducted.
- **Energy and Atmosphere**
  - Concentration on Commissioning (Cx) of building energy systems, minimum energy performance, refrigerant management, on-site renewable energy and the use of green power will be conducted in addition to other requirements of this section.
- **Materials and Resources**
  - Concentration on storage and collection of recyclables, building reuse, construction waste management, materials reuse and recycled content will be conducted in addition to other requirements of this section.
- **Indoor Environmental Quality**
  - Concentration on minimum indoor air quality, environmental tobacco smoke control, outdoor air delivery monitoring, construction indoor air quality management plan, low emitting materials and lighting and thermal controls will be conducted in addition to other requirements of this section.

ECM IMPLEMENTATION PHASE SUMMARY										
Number	**Energy Conservation Measure (ECM)**	**Cost**	**Electric Savings, KW**	**Electric Savings, KWH**	**Electric Savings, kBtu**	**Natural Gas Savings, Therms**	**Natural Gas Savings, kBtu**	**Annual Savings**	**Simple Payback**	**Simple Return on Investment**
	PHASE I									
ECM-PG-6	Install Programmable Thermostats	$200	-	1.0	3.4	0.15	15.00	$83	2.4	43.6%
ECM-PO-2	Install Programmable Thermostats	$200	-	1.0	3.4	0.15	15.00	$83	2.4	43.6%
ECM-UB-1	Install Programmable Thermostats	$200	-	1.0	3.4	0.15	15.00	$83	2.4	43.6%
ECM-AB-6	Install Programmable Thermostats	$1,200	-	1.5	5.1	94	9,400.00	$146	8.2	10.9%
ECM-MB-7	Retro-Commissioning	$2,925	-	23,580	80,455.0	483	48,300.00	$4,104	0.7	142.7%
ECM-PG-7	Retro-Commissioning	$1,035	-	4,247	14,490.8	110	10,950.00	$885	1.2	87.9%
ECM-PR-5	Retro-Commissioning	$1,200	-	4,332	14,780.8	118	11,800.00	$721	1.7	62.4%
ECM-SC-8	Retro-Commissioning	$1,080	-	2,890	9,860.7	267	26,700.00	$644	1.7	62.0%
ECM-AB-8	Retro-Commissioning	$2,160	-	2,598	8,864.4	129	12,900.00	$644	3.4	29.4%
	PHASE I Totals	$10,200	0.00	37,652		1,200.95		$7,393	1.38	
	PHASE II									
ECM-AB-1	Lighting Upgrade - Fluorsescent Lighting	$2,884	3.20	7,707	26,296.3	-		$1,310	2.2	66.6%
ECM-AB-2	Lighting Upgrade - CFL Lighting	$245	0.54	626	2,135.9	-		$106	2.3	61.5%
ECM-AB-3	Lighting Upgrade - Lighting Controls	$715	-	1,040	3,548.5	-		$144	4.0	26.1%
ECM-MB-1	Lighting Upgrade - Fluorsescent Lighting	$21,320	7.54	40,321	137,575.3	-		$4,106	5.2	33.8%
ECM-MB-2	Lighting Upgrade - Compact Fluorescent	$2,242	3.27	13,343	45,526.3	-		$1,834	1.2	89.6%
ECM-MB-3	Lighting Upgrade - Lighting Controls	$660	-	2,380	8,120.6	-		$333	2.0	212.2%
ECM-PG-1	Lighting Upgrade - Fluorsescent Lighting	$13,702	2.77	8,072	27,541.7	-		$1,393	9.8	16.5%
ECM-PG-2	Lighting Upgrade - Compact Fluorescent	$324	0.49	1,365	4,657.4	-		$211	1.5	79.4%
ECM-PG-3	Lighting Upgrade - Lighting Controls	$165	-	279	951.9	-		$47	3.5	30.1%
ECM-PO-1	Lighting Upgrade - Lighting Controls	$440	-	187	638.0	-		$30	14.7	2.4%
ECM-PR-1	Lighting Upgrade - Fluorsescent Lighting	$2,897	2.55	7,395	25,231.7	-		$1,183	2.5	60.6%
ECM-PR-2	Lighting Upgrade - Compact Fluorescent	$629	0.92	2,687	9,168.0	-		$429	1.4	82.0%
ECM-PR-3	Lighting Upgrade - Lighting Controls	$220	-	1,069	3,647.4	-		$181	1.2	84.7%
ECM-RB-1	Lighting Upgrade - Fluorsescent Lighting	$647	0.32	540	1,842.5	-		$86	7.5	31.0%
ECM-RB-2	Lighting Upgrade - Compact Fluorescent	$46	0.08	70	238.8	-		$11	4.2	59.7%
ECM-RB-3	Lighting Upgrade - Lighting Controls	$165	-	202	689.2	-		$32	5.2	20.0%
ECM-SC-1	Lighting Upgrade - Fluorsescent Lighting	$4,134	3.29	3,269	11,153.8	-		$555	7.5	38.3%
ECM-SC-2	Lighting Upgrade - CFL Lighting	$131	0.16	128	436.7	-		$22	6.0	49.4%
ECM-SC-3	Lighting Upgrade - Lighting Controls	$275	-	644	2,197.3	-		$109	2.5	41.7%
ECM-UB-2	Lighting Upgrade - Lighting Controls	$385	-	934	3,186.8	-		$159	2.4	43.4%
	PHASE II Totals	$52,226	25.12	92,258		0.00		$12,281	4.25	
	PHASE III									
ECM-SC-4	Replace Heating Hot Water Boiler	$14,200	-	-		820	82,000.00	$1,336	10.6	9.4%
ECM-SC-7	Domestic Hot Water Heater Replacement	$2,350	6.00	6,240	21,290.9	(143)	-14,300.00	$828	2.8	37.2%
ECM-AB-5	Domestic Hot Water Heater Upgrade	$2,350	-	-		273	27,300.00	$426	5.5	18.5%
ECM-PG-5	Domestic Hot Water Heater Replacement	$3,350	4.50	4,680	15,968.2	(143)	-14,300.00	$556	5.9	16.6%
ECM-PR-4	Domestic Hot Water Heater Replacement	$5,350	4.50	4,680	15,968.2	(143)	-14,300.00	$569	9.4	8.5%
	PHASE III Totals	$27,600	15.00	15,600		664.00		$3,715	7.43	
	PHASE IV									
ECM-SC-5	AC Upgrade - Social Hall	$15,750	-	11,376	38,814.9	-		$1,934	8.1	11.0%
ECM-SC-6	AC Upgrade - Lobby, Vestibule, Office	$4,625	-	3,240	11,054.9	-		$551	8.4	10.5%
ECM-MB-4	Replace Heating Hot Water Boiler	$32,275	-	-		2,320	232,000.00	$3,789	8.5	10.6%
ECM-MB-5	Replace Domestic Water Generator	$29,430	-	-		1,624	162,400.00	$2,582	11.4	5.8%
	PHASE IV Totals	$82,080	0.00	14,616		3,944.00		$8,856	9.27	
	PHASE V									
ECM-RB-4	Heating System Upgrade - Furnace	$4,700	-	-		287	28,700.00	$456	10.3	7.3%
ECM-MB-6	Install Double-Pane Insulating Windows	$58,000	-	10,591	36,136.5	5,843	584,300.00	$10,773	5.4	19.0%
ECM-PG-4	AC System Upgrade - Offices & Lockers	$6,475	-	748	2,552.2	149	14,900.00	$364	17.8	0.0%
ECM-AB-7	Install 1st Floor Double-Pane Windows	$15,200	-	2,973	10,143.9	164	16,400.00	$759	20.0	-1.4%
ECM-AB-4	Replace Heating Hot Water Boiler	$12,100	-	-		350	35,000.00	$642	18.8	0.8%
	PHASE V Totals	$96,475	0.00	14,312		6,793.00		$12,994	7.42	

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Municipal Building

Building ID: 1793931
For 12-month Period Ending: February 28, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: July 17, 2009

Facility
Municipal Building
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1975
Gross Floor Area (ft²): 19,500

Energy Performance Rating[2] (1-100) 35

Site Energy Use Summary[3]	
Natural Gas (kBtu)[4]	0
Electricity (kBtu)	1,502,645
Total Energy (kBtu)	1,502,645

Energy Intensity[5]	
Site (kBtu/ft²/yr)	82
Source (kBtu/ft²/yr)	275

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	229

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	70
National Average Source EUI	235
% Difference from National Average Source EUI	17%
Building Type	Office

Stamp of Certifying Professional

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

Meets Industry 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
N/A

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Municipal 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	125 South Route 73, Braddock, NJ 08037	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐

Municipal Building (Office)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	19,500 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	90 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	40	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	64	Is this the number of personal computers in the Office?		☐
Percent Cooled	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity		
Meter: Electric (kWh) **Space(s):** Municipal Building		
Start Date	**End Date**	**Energy Use (kWh)**
01/25/2009	02/24/2009	34,720.00
12/25/2008	01/24/2009	36,800.00
11/25/2008	12/24/2008	31,440.00
10/25/2008	11/24/2008	34,080.00
09/25/2008	10/24/2008	43,120.00
08/25/2008	09/24/2008	45,440.00
07/25/2008	08/24/2008	43,520.00
06/25/2008	07/24/2008	52,880.00
05/25/2008	06/24/2008	41,840.00
04/25/2008	05/24/2008	35,920.00
03/25/2008	04/24/2008	35,440.00
Electric Consumption (kWh)		**435,200.00**
Electric Consumption (kBtu)		**1,484,902.40**
Total Electricity Consumption (kBtu)		**1,484,902.40**
Is this the total Electricity consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas		
Meter: Gas (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
01/25/2009	02/24/2009	4,403.00
12/25/2008	01/24/2009	5,781.66
11/25/2008	12/24/2008	3,771.04
10/25/2008	11/24/2008	2,033.04
09/25/2008	10/24/2008	569.80
08/25/2008	09/24/2008	205.60
07/25/2008	08/24/2008	154.80
06/25/2008	07/24/2008	176.29
05/25/2008	06/24/2008	239.20
04/25/2008	05/24/2008	835.11

03/25/2008	04/24/2008	1,505.26
Gas Consumption (therms)		**19,674.80**
Gas Consumption (kBtu)		**1,967,480.00**
Total Natural Gas Consumption (kBtu)		**1,967,480.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Municipal Building
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Municipal Building	
Gross Floor Area Excluding Parking: (ft^2)	19,500
Year Built	1975
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

Municipal Building	
Space Type	Office
Gross Floor Area(ft^2)	19,500
Weekly operating hours	90
Workers on Main Shift	40
Number of PCs	64
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2009)	**Baseline** (Ending Date 02/28/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	35	35	75	N/A	50
Energy Intensity					
Site (kBtu/ft^2)	82	82	52	N/A	70
Source (kBtu/ft^2)	275	275	174	N/A	235
Energy Cost					
$/year	$ 62,559.90	$ 62,559.90	$ 39,524.69	N/A	$ 53,442.90
$/$ft^2$/year	$ 3.21	$ 3.21	$ 2.03	N/A	$ 2.74
Greenhouse Gas Emissions					
$MtCO_2e$/year	229	229	145	N/A	196
$kgCO_2e/ft^2$/year	12	12	8	N/A	10

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

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

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Public Works Office

Building ID: 1794196
For 12-month Period Ending: February 28, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: July 20, 2009

Facility
Public Works Office
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 2008
Gross Floor Area (ft²): 1,200

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

Site Energy Use Summary[3]	
Electricity (kBtu)	37,156
Natural Gas (kBtu)[4]	0
Total Energy (kBtu)	37,156

Energy Intensity[5]	
Site (kBtu/ft²/yr)	33
Source (kBtu/ft²/yr)	111

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	6

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	77
National Average Source EUI	182
% Difference from National Average Source EUI	-39%
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
N/A

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Public Works Office	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	125 South Route 73, Braddock, NJ 08037	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		☐

Public Works Office (Office)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	1,200 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	40 Hours	Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	6	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	7	Is this the number of personal computers in the Office?		☐
Percent Cooled	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐

ENERGY STAR® Data Checklist
for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity		
Meter: Electric (kWh (thousand Watt-hours)) **Space(s):** Public Works Office		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
01/25/2009	02/24/2009	1,141.00
12/25/2008	01/24/2009	1,328.00
11/25/2008	12/24/2008	1,206.00
10/25/2008	11/24/2008	879.00
09/25/2008	10/24/2008	818.00
08/25/2008	09/24/2008	520.00
07/25/2008	08/24/2008	1,092.00
06/25/2008	07/24/2008	1,552.00
05/25/2008	06/24/2008	1,035.00
04/25/2008	05/24/2008	190.00
03/25/2008	04/24/2008	899.00
Electric Consumption (kWh (thousand Watt-hours))		**10,660.00**
Electric Consumption (kBtu)		**36,371.92**
Total Electricity Consumption (kBtu)		**36,371.92**
Is this the total Electricity consumption at this building including all Electricity meters?		☐

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Public Works Office
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Public Works Office	
Gross Floor Area Excluding Parking: (ft^2)	1,200
Year Built	2008
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

Public Works Office	
Space Type	Office
Gross Floor Area(ft^2)	1,200
Weekly operating hours	40
Workers on Main Shift	6
Number of PCs	7
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2009)	**Baseline** (Ending Date 02/28/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft^2)	33	33	34	N/A	77
Source (kBtu/ft^2)	111	111	114	N/A	182
Energy Cost					
$/year	$ 1,794.25	$ 1,794.25	$ 1,841.35	N/A	$ 4,168.90
$/$ft^2$/year	$ 1.50	$ 1.50	$ 1.54	N/A	$ 3.49
Greenhouse Gas Emissions					
$MtCO_2e$/year	6	6	6	N/A	14
$kgCO_2e/ft^2$/year	5	5	5	N/A	12

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

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

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Public Works Garage

Building ID: 1794013
For 12-month Period Ending: February 28, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: September 08, 2009

Facility
Public Works Garage
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1977
Gross Floor Area (ft²): 6,900

Energy Performance Rating[2] (1-100) 89

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	290,176
Natural Gas - (kBtu)[4]	0
Total Energy (kBtu)	290,176

Energy Intensity[5]	
Site (kBtu/ft²/yr)	42
Source (kBtu/ft²/yr)	140

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	44

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	95
National Average Source EUI	318
% Difference from National Average Source EUI	-56%
Building Type	Warehouse (Unrefrigerated)

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
N/A

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Public Works Garage	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Warehouse (Unrefrigerated)	Is this an accurate description of the space in question?		☐
Location	125 South Route 73, Braddock, NJ 08037	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		☐
Public Works Garage (Warehouse (Unrefrigerated))				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	6,900 Sq. Ft.	Is this the total gross floor area as measured between the principal exterior surfaces of the enclosing fixed walls and including all supporting functions? The total gross floor area should include offices, lobbies, rest rooms, equipment storage areas, mechanical rooms, employee break rooms, cafeterias, elevators, stairwells, all space occupied by refrigeration/freezer units, and all areas that are entirely refrigerated. Existing atriums or areas with high ceilings should only include the base floor area that they occupy. The total gross floor area should not include outside loading bays or docks.		☐
Workers on Main Shift	50	Does this number represent the average number of workers that are present during the primary shift (that is, the shift with the most workers)? Note: this is not the total number of staff employed at the property. For example, if there are three daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐
Weekly operating hours	40 Hours	Is this the total number of hours per week that this warehouse space is in operation, excluding hours when the facility is occupied by maintenance, security, or other support personnel? Note: the average warehouse space operates 60 hours per week.		☐
Percent Cooled	20 %	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?		☐
Number of walk-in refrigeration/freezer units	0	Does this count include all large walk-in refrigeration or freezer units at the warehouse?		☐
Distribution Center	No (Optional)	Is this building considered a distribution center?		☐

ENERGY STAR® Data Checklist
for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity		
Meter: Electric (kWh (thousand Watt-hours)) **Space(s):** Public Works Garage **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
01/25/2009	02/24/2009	6,273.00
12/25/2008	01/24/2009	7,130.00
11/25/2008	12/24/2008	6,885.00
10/25/2008	11/24/2008	6,796.00
09/25/2008	10/24/2008	7,323.00
08/25/2008	09/24/2008	8,631.00
07/25/2008	08/24/2008	9,034.00
06/25/2008	07/24/2008	8,329.00
05/25/2008	06/24/2008	6,523.00
04/25/2008	05/24/2008	5,644.00
03/25/2008	04/24/2008	5,971.00
Electric Consumption (kWh (thousand Watt-hours))		**78,539.00**
Electric Consumption (kBtu (thousand Btu))		**267,975.07**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**267,975.07**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

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

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Public Works Garage
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Public Works Garage	
Gross Floor Area Excluding Parking: (ft^2)	6,900
Year Built	1977
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

Public Works Garage	
Space Type	Warehouse (Unrefrigerated)
Gross Floor Area(ft^2)	6,900
Workers on Main Shift	50
Weekly operating hours	40
Percent Cooled	20
Percent Heated	100
Number of walk-in refrigeration/freezer units	0
Distribution Center[o]	N

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2009)	**Baseline** (Ending Date 02/28/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	89	89	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	42	42	63	N/A	95
Source (kBtu/ft²)	140	140	209	N/A	318
Energy Cost					
$/year	$ 13,327.12	$ 13,327.12	$ 19,871.83	N/A	$ 30,121.51
$/ft²/year	$ 1.93	$ 1.93	$ 2.88	N/A	$ 4.36
Greenhouse Gas Emissions					
$MtCO_2e$/year	44	44	66	N/A	99
$kgCO_2e/ft^2$/year	6	6	9	N/A	14

More than 50% of your building is defined as Warehouse (Unrefrigerated). 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.

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Road Building

Building ID: 1794203
For 12-month Period Ending: February 28, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: July 15, 2009

Facility
Road Building
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1977
Gross Floor Area (ft²): 1,000

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

Site Energy Use Summary[3]	
Electricity (kBtu)	210,319
Natural Gas (kBtu)[4]	0
Total Energy (kBtu)	210,319

Energy Intensity[5]	
Site (kBtu/ft²/yr)	225
Source (kBtu/ft²/yr)	752

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	32

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	77
National Average Source EUI	182
% Difference from National Average Source EUI	313%
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
N/A

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Road 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	125 South Route 73, Braddock, NJ 08037	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		☐

Road Building (Office)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	1,000 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	40 Hours	Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	2	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	1	Is this the number of personal computers in the Office?		☐
Percent Cooled	Less than 50%	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐

ENERGY STAR® Data Checklist
for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity		
Meter: Electric (kWh) **Space(s):** Road Building		
Start Date	**End Date**	**Energy Use (kWh)**
01/25/2009	02/24/2009	12,623.00
12/25/2008	01/24/2009	13,642.00
11/25/2008	12/24/2008	9,475.00
10/25/2008	11/24/2008	4,794.00
09/25/2008	10/24/2008	971.00
08/25/2008	09/24/2008	1,634.00
07/25/2008	08/24/2008	2,706.00
06/25/2008	07/24/2008	3,713.00
05/25/2008	06/24/2008	2,384.00
04/25/2008	05/24/2008	1,299.00
03/25/2008	04/24/2008	7,227.00
Electric Consumption (kWh)		**60,468.00**
Electric Consumption (kBtu)		**206,316.82**
Total Electricity Consumption (kBtu)		**206,316.82**
Is this the total Electricity consumption at this building including all Electricity meters?		☐

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Road Building
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Road Building	
Gross Floor Area Excluding Parking: (ft^2)	1,000
Year Built	1977
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

Road Building	
Space Type	Office
Gross Floor Area(ft^2)	1,000
Weekly operating hours	40
Workers on Main Shift	2
Number of PCs	1
Percent Cooled	Less than 50%
Percent Heated	50% or more

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2009)	**Baseline** (Ending Date 02/28/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft^2)	225	225	11	N/A	77
Source (kBtu/ft^2)	752	752	35	N/A	182
Energy Cost					
$/year	$ 9,602.46	$ 9,602.46	$ 452.99	N/A	$ 3,284.42
$/$ft^2$/year	$ 9.60	$ 9.60	$ 0.45	N/A	$ 3.28
Greenhouse Gas Emissions					
$MtCO_2e$/year	32	32	2	N/A	11
$kgCO_2e/ft^2$/year	32	32	2	N/A	11

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

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

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Police Records Building

Building ID: 1794041
For 12-month Period Ending: February 28, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: July 20, 2009

Facility
Police Records Building
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1985
Gross Floor Area (ft²): 4,000

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

Site Energy Use Summary[3]	
Electricity (kBtu)	278,370
Natural Gas (kBtu)[4]	0
Total Energy (kBtu)	278,370

Energy Intensity[5]	
Site (kBtu/ft²/yr)	74
Source (kBtu/ft²/yr)	249

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	42

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	77
National Average Source EUI	182
% Difference from National Average Source EUI	37%
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
N/A

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Police Records 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	125 South Route 73, Braddock, NJ 08037	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		☐

Police Records Building (Office)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	4,000 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	40 Hours	Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	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	15	Is this the number of personal computers in the Office?		☐
Percent Cooled	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐

ENERGY STAR® Data Checklist
for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity		
Meter: Electric (kWh (thousand Watt-hours)) **Space(s):** Police Records Building		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
01/25/2009	02/24/2009	5,636.00
12/25/2008	01/24/2009	6,516.00
11/25/2008	12/24/2008	5,731.00
10/25/2008	11/24/2008	5,747.00
09/25/2008	10/24/2008	7,080.00
08/25/2008	09/24/2008	8,981.00
07/25/2008	08/24/2008	9,270.00
06/25/2008	07/24/2008	11,729.00
05/25/2008	06/24/2008	8,536.00
04/25/2008	05/24/2008	5,783.00
03/25/2008	04/24/2008	5,733.00
Electric Consumption (kWh (thousand Watt-hours))		**80,742.00**
Electric Consumption (kBtu)		**275,491.70**
Total Electricity Consumption (kBtu)		**275,491.70**
Is this the total Electricity consumption at this building including all Electricity meters?		☐

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Police Records Building
125 South Route 73
Braddock, NJ 08037

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Police Records Building	
Gross Floor Area Excluding Parking: (ft^2)	4,000
Year Built	1985
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

Police Records Building	
Space Type	Office
Gross Floor Area(ft^2)	4,000
Weekly operating hours	40
Workers on Main Shift	15
Number of PCs	15
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2009)	**Baseline** (Ending Date 02/28/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft^2)	74	74	34	N/A	77
Source (kBtu/ft^2)	249	249	115	N/A	182
Energy Cost					
$/year	$ 13,642.12	$ 13,642.12	$ 6,311.01	N/A	$ 14,101.80
$/$ft^2$/year	$ 3.41	$ 3.41	$ 1.58	N/A	$ 3.52
Greenhouse Gas Emissions					
$MtCO_2e$/year	42	42	19	N/A	43
$kgCO_2e/ft^2$/year	11	11	5	N/A	11

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

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

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Annex Building

Building ID: 1784022
For 12-month Period Ending: February 28, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: July 17, 2009

Facility
Annex Building
402 Tansboro Road
Berlin, NJ 08009

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1945
Gross Floor Area (ft²): 7,200

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

Site Energy Use Summary[3]	
Electricity (kBtu)	170,217
Natural Gas (kBtu)[4]	232,848
Total Energy (kBtu)	403,065

Energy Intensity[5]	
Site (kBtu/ft²/yr)	59
Source (kBtu/ft²/yr)	119

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	38

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	65
National Average Source EUI	131
% Difference from National Average Source EUI	-9%
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
N/A

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Annex 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	402 Tansboro Road, Berlin, NJ 08009	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		☐

Annex (Office)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	7,200 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	40 Hours	Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	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	10	Is this the number of personal computers in the Office?		☐
Percent Cooled	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐

ENERGY STAR® Data Checklist
for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity		
Meter: Electric (kWh) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (kWh)**
01/19/2009	02/18/2009	3,487.00
12/19/2008	01/18/2009	3,540.00
11/19/2008	12/18/2008	3,637.00
10/19/2008	11/18/2008	3,143.00
09/19/2008	10/18/2008	4,224.00
08/19/2008	09/18/2008	6,204.00
07/19/2008	08/18/2008	6,142.00
06/19/2008	07/18/2008	5,940.00
05/19/2008	06/18/2008	5,306.00
04/19/2008	05/18/2008	3,799.00
03/19/2008	04/18/2008	3,316.00
Electric Consumption (kWh)		**48,738.00**
Electric Consumption (kBtu)		**166,294.06**
Total Electricity Consumption (kBtu)		**166,294.06**
Is this the total Electricity consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas		
Meter: Gas (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
01/19/2009	02/18/2009	580.16
12/19/2008	01/18/2009	535.61
11/19/2008	12/18/2008	407.15
10/19/2008	11/18/2008	236.33
09/19/2008	10/18/2008	21.76
08/19/2008	09/18/2008	6.17
07/19/2008	08/18/2008	5.16
06/19/2008	07/18/2008	5.19
05/19/2008	06/18/2008	23.04
04/19/2008	05/18/2008	78.36

03/19/2008	04/18/2008	287.65
Gas Consumption (therms)		**2,186.58**
Gas Consumption (kBtu)		**218,658.00**
Total Natural Gas Consumption (kBtu)		**218,658.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Annex Building
402 Tansboro Road
Berlin, NJ 08009

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Annex Building	
Gross Floor Area Excluding Parking: (ft^2)	7,200
Year Built	1945
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

Annex	
Space Type	Office
Gross Floor Area(ft^2)	7,200
Weekly operating hours	40
Workers on Main Shift	15
Number of PCs	10
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2009)	**Baseline** (Ending Date 02/28/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	58	58	75	N/A	50
Energy Intensity					
Site (kBtu/ft^2)	59	59	48	N/A	65
Source (kBtu/ft^2)	119	119	97	N/A	131
Energy Cost					
$/year	$ 12,163.03	$ 12,163.03	$ 9,897.31	N/A	$ 13,383.67
$/$ft^2$/year	$ 1.69	$ 1.69	$ 1.38	N/A	$ 1.86
Greenhouse Gas Emissions					
$MtCO_2e$/year	38	38	31	N/A	42
$kgCO_2e/ft^2$/year	5	5	4	N/A	6

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.

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Utilities Building

Building ID: 1845040
For 12-month Period Ending: February 28, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: September 03, 2009

Facility
Utilities Building
700 Chews Landing Road
Sicklerville, NJ 08081

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 2005
Gross Floor Area (ft²): 2,000

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

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	76,821
Natural Gas (kBtu)[4]	28,757
Total Energy (kBtu)	105,578

Energy Intensity[5]	
Site (kBtu/ft²/yr)	53
Source (kBtu/ft²/yr)	143

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	13

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	77
National Average Source EUI	182
% Difference from National Average Source EUI	-21%
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
N/A

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Utilities 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	700 Chews Landing Road, Sicklerville, NJ 08081	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		☐
Utilities Building (Office)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	2,000 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	40 Hours	Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	10	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	5	Is this the number of personal computers in the Office?		☐
Percent Cooled	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity		
Meter: Electric (kWh (thousand Watt-hours)) **Space(s):** Entire Facility **Generation Method:** Grid Purchase		
Start Date	**End Date**	**Energy Use (kWh (thousand Watt-hours))**
01/28/2009	02/27/2009	1,500.00
12/28/2008	01/27/2009	2,067.00
11/28/2008	12/27/2008	1,471.00
10/28/2008	11/27/2008	1,345.00
09/28/2008	10/27/2008	1,875.00
08/28/2008	09/27/2008	2,237.00
07/28/2008	08/27/2008	2,252.00
06/28/2008	07/27/2008	2,849.00
05/28/2008	06/27/2008	2,083.00
04/28/2008	05/27/2008	1,640.00
03/28/2008	04/27/2008	1,481.00
Electric Consumption (kWh (thousand Watt-hours))		**20,800.00**
Electric Consumption (kBtu (thousand Btu))		**70,969.60**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**70,969.60**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas		
Meter: GAS (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
01/28/2009	02/27/2009	62.16
12/28/2008	01/27/2009	83.04
11/28/2008	12/27/2008	56.98
10/28/2008	11/27/2008	26.83
09/28/2008	10/27/2008	3.11
08/28/2008	09/27/2008	3.08
07/28/2008	08/27/2008	3.10
06/28/2008	07/27/2008	3.11
05/28/2008	06/27/2008	3.12
04/28/2008	05/27/2008	5.16
03/28/2008	04/27/2008	14.43

GAS Consumption (therms)	**264.12**
GAS Consumption (kBtu (thousand Btu))	**26,412.00**
Total Natural Gas Consumption (kBtu (thousand Btu))	**26,412.00**
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
Utilities Building
700 Chews Landing Road
Sicklerville, NJ 08081

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Utilities Building	
Gross Floor Area Excluding Parking: (ft^2)	2,000
Year Built	2005
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

Utilities Building	
Space Type	Office
Gross Floor Area(ft^2)	2,000
Weekly operating hours	40
Workers on Main Shift	10
Number of PCs	5
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2009)	**Baseline** (Ending Date 02/28/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft^2)	53	53	32	N/A	77
Source (kBtu/ft^2)	143	143	86	N/A	182
Energy Cost					
$/year	$ 4,200.87	$ 4,200.87	$ 2,515.43	N/A	$ 6,127.43
$/$ft^2$/year	$ 2.10	$ 2.10	$ 1.26	N/A	$ 3.06
Greenhouse Gas Emissions					
$MtCO_2e$/year	13	13	8	N/A	19
$kgCO_2e/ft^2$/year	7	7	4	N/A	10

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

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

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Senior Citizens Center

Building ID: 1785330
For 12-month Period Ending: February 28, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: July 01, 2009

Facility
Senior Citizens Center
33 Coopers Folly Road
Atco, NJ 08004

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1992
Gross Floor Area (ft²): 7,200

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

Site Energy Use Summary[3]	
Electricity (kBtu)	188,609
Natural Gas (kBtu)[4]	485,971
Total Energy (kBtu)	674,580

Energy Intensity[5]	
Site (kBtu/ft²/yr)	98
Source (kBtu/ft²/yr)	165

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	55

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison	
National Average Site EUI	52
National Average Source EUI	102
% Difference from National Average Source EUI	62%
Building Type	Social/Meeting

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
N/A

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Senior Citizens Center	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Social/Meeting	Is this an accurate description of the space in question?		☐
Location	33 Coopers Folly Road, Atco, NJ 08004	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		☐

Senior Citizens Center (Other)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	7,200 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	1 (Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	35 Hours(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	5 (Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity		
Meter: Electric (kWh) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (kWh)**
01/17/2009	02/16/2009	4,489.00
12/17/2008	01/16/2009	4,948.00
11/17/2008	12/16/2008	4,384.00
10/17/2008	11/16/2008	4,003.00
09/17/2008	10/16/2008	3,452.00
08/17/2008	09/16/2008	4,977.00
07/17/2008	08/16/2008	6,273.00
06/17/2008	07/16/2008	6,719.00
05/17/2008	06/16/2008	5,313.00
04/17/2008	05/16/2008	3,909.00
03/17/2008	04/16/2008	4,912.00
Electric Consumption (kWh)		**53,379.00**
Electric Consumption (kBtu)		**182,129.15**
Total Electricity Consumption (kBtu)		**182,129.15**
Is this the total Electricity consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas		
Meter: Gas (therms) **Space(s):** Entire Facility		
Start Date	**End Date**	**Energy Use (therms)**
01/17/2009	02/16/2009	1,094.02
12/17/2008	01/16/2009	898.91
11/17/2008	12/16/2008	635.07
10/17/2008	11/16/2008	474.72
09/17/2008	10/16/2008	103.60
08/17/2008	09/16/2008	87.38
07/17/2008	08/16/2008	79.46
06/17/2008	07/16/2008	87.11
05/17/2008	06/16/2008	154.96
04/17/2008	05/16/2008	278.37

03/17/2008	04/16/2008	599.01
Gas Consumption (therms)		**4,492.61**
Gas Consumption (kBtu)		**449,261.00**
Total Natural Gas Consumption (kBtu)		**449,261.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Senior Citizens Center
33 Coopers Folly Road
Atco, NJ 08004

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Senior Citizens Center	
Gross Floor Area Excluding Parking: (ft^2)	7,200
Year Built	1992
For 12-month Evaluation Period Ending Date:	February 28, 2009

Facility Space Use Summary

Senior Citizens Center	
Space Type	Other - Social/Meeting
Gross Floor Area(ft^2)	7,200
Number of PCs°	1
Weekly operating hours°	35
Workers on Main Shift°	5

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 02/28/2009)	**Baseline** (Ending Date 02/28/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft^2)	98	98	0	N/A	52
Source (kBtu/ft^2)	165	165	0	N/A	102
Energy Cost					
$/year	$ 17,358.52	$ 17,358.52	N/A	N/A	$ 9,211.58
$/$ft^2$/year	$ 2.41	$ 2.41	N/A	N/A	$ 1.28
Greenhouse Gas Emissions					
$MtCO_2e$/year	55	55	0	N/A	29
$kgCO_2e/ft^2$/year	8	8	0	N/A	4

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

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