PV Solar System Evaluation, Design, Specification and Installation Oversight

Municipal Center

HRP Associates, Inc. completed a feasibility and solar potential review of municipality-owned buildings including the Senior Center, Town Hall, Public Works Garage, and Water Treatment plant. In particular, each building was reviewed for:

- *Equipment Installation Feasibility* - Type of roof, available space, ease of access, and general roof condition.
- *Orientation* – Tilt of roof and orientation to south.
- *Shading Analysis* – Utilizing a Solar Pathfinder, the potential shading from on-site features will impact the potential solar input and the percentage of solar energy that is available at each site each month of the year.
- *Electrical Tie-In Features* – Ease and associated costs of tying into each facility's existing electrical service.
- *Structure* – Ability to attach equipment to the roof and the visual condition of the roof.

The collected information, which concluded the Town Hall as the best candidate, was summarized in a solar report that detailed each building's solar potential and projected energy savings. Following the submission and approval of the Solar Report by the Town Board, HRP completed a solar design and specification for the installation of a 14 kW system including a kiosk in the Town Hall lobby to allow citizen access to the PV system monitoring information. The kiosk which includes a micro-processor collects all relevant measurement and verification information required by the grant. The kiosk also educates citizens on solar PV potential and provides real time electricity generation information. The system installation was completed in February 2011.

HRP Associates, Inc. was selected by the municipality to complete an Energy Conservation Audit and Renewable Energy Feasibility Study of the town buildings under the EECBG funding program. The primary purpose of these studies was to:

- Identify and Evaluate Energy Conservation Measures (ECMs);
- Determine the feasibility of using Geothermal and Wind Turbine technology as a source of building heating/cooling and electricity to reduce the overall dependence on purchased energy; and
- Complete required EECBG reporting and measurement and verification.

continued

FIRM

HRP Associates, Inc.
197 Scott Swamp Road
Farmington, CT 06032
(860) 674-9570

VALUE

$100,000

- *HRP completed a feasibility and solar potential review of municipality-owned buildings*
- *The collected information was summarized in a solar report that detailed each building's solar potential and projected energy savings.*
- *HRP also completed an Energy Conservation Audit and Renewable Energy Feasibility Study of the town buildings under the EECBG funding program.*

PV Solar System Evaluation, Design, Specification and Installation Oversight

Municipal Center

continued

HRP collected relevant energy consumption, building characteristics, and equipment data. Initially, EPA's Portfolio Manager was utilized to benchmark each building based on an operational characteristic to assist in the building evaluation and prioritize potential energy savings. Following the completion of the benchmarking process, an inspection of each building was completed to collect relevant information including:

- Lighting system and controls;
- Plug loads (i.e., computers, & general electrical outlet loads);
- Building envelope;
- HVAC systems and controls; and
- Motors and pumps.

Each of the identified ECMs was evaluated using appropriate software and Energy Estimators to evaluate potential savings under various operating or equipment modification/replacement scenarios. Each of the identified ECO's was reviewed to identify:

- Life expectancy;
- Projected lifetime energy and cost savings;
- Annual CO_2 equivalent savings in pounds;
- Implementation costs;
- Available rebates and grants;
- Total project cost and estimated annual energy and cost savings based on:
  - Simple payback;
  - Return on investment; and
  - Site and source energy input.

In summary, HRP recommended various lighting retrofits, operational modifications, and equipment upgrades. In addition, HRP completed a Renewable Energy Feasibility Study including wind, solar, and geothermal. The study determined that due to the relatively low energy usage per square foot, its accessibility, and lack of shading, the Town Hall offered the best location for the installation of a solar system and geothermal system. After discussion with the town, it was decided to pursue a solar system due to the availability of funding. Subsequently, HRP completed a grant application to obtain funding. Upon approval of the grant application, HRP completed a solar design and specification for the installation of a solar system. The proposed system will include a monitor to collect all relevant measurement and verification information.

HRP is currently overseeing the installation of the solar PV system. Throughout the process, HRP completed the EECBG reporting requirements.