

Photovoltaic Energy System

Town Hall

HRP Associates, Inc. assisted this Northeastern township with the installation of a 34 kW, \$187,000 Photovoltaic system at the Town Hall that will produce 40,768 kWh/y, or 20 percent of the building's annual usage, and result in an electric cost savings of \$4,000 per year.

To complete the project, HRP initially completed energy audits to identify potential Energy Conservation Measures (ECMs) at the Town Hall, Community Center, DPW, Historical Society and library. The energy audits, which identified over 100 potential ECMs, consisted of initially benchmarking each building's Energy Use Intensity (EUI) by inputting energy use information and building characteristics into the EPA's Energy Portfolio Manager to compare each building's energy use profile against buildings of comparable operations, size, and climatic region.

After comparing and understanding the buildings' profiles, HRP completed detailed inspections to identify and understand building equipment operations. The collected information was then analyzed to identify potential ECMs. The costs to implement each ECM and potential cost and energy saving associated with the ECM were calculated using various software, energy estimators, contractor quotes and engineering judgment to identify each ECM:

- Life expectancy and cost savings
- Total project cost and estimated annual energy and cost savings based on Simple Payback, Equity Payback and Return on Investment; ECM Annual CO₂ Equivalent savings in pounds
- Available incentives

Also, during the audit the feasibility of utilizing renewable energy sources at each of the buildings was evaluated. The analysis determined that geo-thermal was an unfavorable option due to the limited operation of the building, lack of incentives, and good condition of HVAC equipment.

Next, an analysis was conducted of various wind turbines ranging from 5 to 10 kW and various heights. The computer modeling determined that wind power's equity payback ranged from 16 to 24 years; therefore, wind was also rejected.

Lastly, a solar review of the buildings determined that the Town Hall was the best candidate for installation of a PV system due to its electric use, orientation, limited shading and ease of electrical tie-in.

The PV system was activated on July 27, 2011. Almost immediately, solar energy was converted to AC to help power the Town Hall. For a short period on day one, the system supplied excess power and fed back to the grid. What a great ending to this project and new sustainable beginning for the town. In just under two weeks, nearly 100 barrels of oil have been replaced!

FIRM

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VALUE

\$187,000

■ *The feasibility of utilizing various renewable energy sources for the Town Hall was evaluated and a PV system was selected*

■ *In just under two weeks, nearly 100 barrels of oil have been replaced by photovoltaic energy*

■ *The \$187,000 PV Town Hall's PV system will produce 20% of the building's annual energy usage and provide an electrical energy cost savings of \$4,000 per year*