MILLION Solar ROOFS

SUCCESS STORIES

The goal of the Million Solar Roofs Initiative is to install one million solar energy systems on U.S. buildings by 2010. President Clinton announced the Initiative on June 26, 1997 in a speech before the United Nations Session on Environment and Development. The Initiative focuses on two types of solar energy technology — photovoltaics that produce electricity from sunlight, and solar thermal systems that produce heat for domestic hot water, space heating or heating swimming pools. The U.S. Department of Energy leads this effort in partnership with the building industry, other federal agencies, utilities, the solar energy industry, financial institutions, state and local governments, and non-governmental organizations. These partnerships concentrate on removing market barriers and developing and strengthening demand for solar energy products and applications. As progress is made toward the goal of one million solar roofs, greenhouse gases and other harmful emissions will be reduced, high tech jobs will be created, and the U.S. solar energy industry will retain its competitive edge.

Project: National Park Service Shivwits Plateau Photovoltaic Installation

Type: Off-grid residential PV system

Location: Shivwits Plateau, Arizona

Background: Located 95 miles from St. George, Utah, high on the Shivwits Plateau, north of the Grand Canyon, the National Park Service manages the resources of this high desert. From May through September, summer staff operate out of two dormitories that were originally served by propane and diesel generators. Fuel had to be delivered by truck from St. George over an unpaved and minimally maintained gravel, rock, dirt and mud roadway. Therefore, providers demanded premium rates and a surcharge from wear and tear on delivery vehicles. This near-wilderness setting was impacted by the noise and exhaust of electrical generation 24 hours a day, seven days a week. Located so close to the Grand Canyon, the National Park Service wanted to be an active partner in the major, multi-state effort to improve the air quality of the Grand Canyon National Park. Sandia Laboratories had conducted a study and preliminary design for this installation a few years earlier and determined that this site was suitable for a photovoltaic installation. However, funding was not available to proceed with the project.

In the spring of 1998, the Department of Energy Seattle Regional Support Office and the National Park Service were able to provide the necessary funding and support services. The park installed energy conservation measures to reduce overall load requirements and removed the old diesel generation system (generator and fuel storage system). A trip to the site in April provided Mike Nelson, chief project designer and trainer from Washington State University, under a cooperative agreement with the U.S. Department of Energy, the opportunity to work with Park staff, assess equipment requirements, detail energy conservation measures, and begin the process of bringing staff and material together for an August training/installation project. The Park Service provided trainees from nine other parks and operations. (Past training had shown that these

employees take this new understanding of solar technology back to their home parks and create more projects in-house.) In August 1997, a 1.2 kW system was installed in a two day instruction session.

System Description: A 1.2 kW PV system, adjacent to the dormitories, was installed in a two day instruction and assembly session. Trace Engineering provided the inverter and Siemens Solar provided the modules. A second inverter was installed in 1998, expanding the system's capacity and further reducing reliance on the backup propane generator for peak load demands.

Financing: In 1997, the Department of Energy Seattle Regional Support Office provided seed money and support services; the National Park Service, through Lake Mead National Recreation Area, provided additional funding, logistical support, and created a training opportunity; private firms (Trace Engineering, Siemens Solar) and Channel Islands National Park provided instructors who joined forces to install the 1.2 kW photovoltaic system.

Climate: The summer seasons are warm and sunny, resembling the climate of Las Vegas. During the winter months the park is not in use so the system's winter performance has not been an issue.

Total Installed Cost: $18,000.

Optimum Maintenance Costs: In 1998, the first full test of the system's operation benefits, the park had to replace one battery and install a second inverter. The second inverter expanded the system's capacity and further reduced any reliance on the backup propane generator.

Savings: As of September 1998, the park has not had to haul any fuel into this facility at a savings approaching $7,000. A simple payback return of less than three seasons could be derived from this savings alone. Furthermore, there is a $500 surcharge added each time the fuel is delivered to the park. There are additional paybacks: trainees have taken these skills back to their parks and more projects have started. Joshua Tree National Park has completed two projects already.

Environmental Benefits: The noise of the power generator ceased with the installation and use of the PV system. In addition, the risk of diesel spills on both the site and on the delivery roads has ended. Air pollution that was generated from vehicles used to transport the fuel was reduced. These environmental benefits alone made this project a success.

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