



SUCCESS STORIES

The goal of the Million Solar Roofs Initiative is to install one million solar energy systems on U.S. buildings by 2010. 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: Channel Islands National Park Solar Energy Installation

Type: Solar Hot Water Heater

Location: Santa Rosa Island (Off Santa Barbara Coast, California)

Background: Channel Islands National Park has a history of utilizing renewable energy to provide power and reduce fossil fuel consumption on the islands. Due to the proven ability of solar technologies to meet other island energy requirements, the decision to utilize solar energy for the new housing area was easy. On the islands, as in other non-grid applications, solar energy is the clear choice to provide power with minimal maintenance or intrusion and in a clean, quiet, non-resource depleting manner.

System Description: Santa Rosa Island lies off the coast of Santa Barbara, 44 miles west of Park headquarters in Ventura, California. Since 1986, this 52,794 acre island, once a cattle ranch, has been part of Channel Islands National Park Service. In 1988, a project to construct housing for park employees presented the National Park Service with the opportunity to install solar thermal rooftop systems for heated domestic hot water.

The housing site is located in a remote location on the island and requires its own independent power systems. Four 9kW solar hot water systems were installed on the rooftops of the residential units in August 1998. (To provide power to the housing facility two off-grid 6.4 kW photovoltaic systems were activated in May 1998. See Channel Islands off-grid PV case study.)

The following companies provided components utilized in the construction of the solar hot water systems:



The four, 40 gallon solar hot water panels were supplied by the Solar Connection of Morro Bay, California and are manufactured by Radco Products of Santa Maria, California. Each hot water panel has the capacity to collect 31,000 btu per day, a 9 kw equivalent.

Financing: Each system was financed through federally appropriated construction funding as part of the electrical system required for the housing project. No outside or grant funding was requested or received.

Because of the island's distance from the mainland, island operations mandates that energy conservation be considered for all projects. For example, the actual cost to provide propane to Santa Rosa Island grows dramatically due to transportation and handling requirements.

Propane is purchased on the mainland for \$.89 a gallon. The 220 gallon (830 liter) tank weighs 2,400 pounds (1090 kg) and on the park's small work boat requires a dedicated trip to the island. The 88 mile (142 km) round trip consumes 186 gallons (705 liters) of diesel, takes seven hours and requires a crane at each end to transfer the tank. Including the man-hours, equipment time, and direct energy consumption, propane on the island is \$3.38 a gallon, 3.8 times the mainland cost.

Climate: The systems operate in a marine environment without temperature extremes. The temperatures on the island seldom go below the high 40's (F) or above the high 80's (F). The primary effect of climate to the system's operating efficiency is the fog which can at times obscure the sky all day. However, solar insolation keeps the systems operational when sufficient energy can penetrate the clouds. Since 1996 an 80 gallon Radco system has operated with good results in a foggier location on San Miguel Island which is 20 miles offshore of this installation.

Total Installed Cost: The cost of each solar water heater was \$1,500 for a total installed project cost of \$6,000.

Optimum Maintenance Costs: Annual maintenance cost is under \$25 per system.

Direct Savings: Simple payback for the island systems will occur in 2.15 years. (The payback for the mainland applications would be 8.18 years.)

Environmental benefits: Annually 744 gallons of diesel would be consumed to deliver the propane offset by the installation of these solar thermal units.

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