Sandia Program Promotes Renewable Energy Technologies In Mexico

On Mexico's Yucatán Peninsula, a submersible pump powered by photovoltaics yields enough water to maintain a heard of cattle on a farmer's small ranch. Hundreds of miles away, in the peninsular desert of Baja California, water automatically flows into cattle troughs and drip-irrigates a crop. Here, too, the power is provided by a new photovoltaic (PV) water-pumping system.

Agua Blanca, Baja California Sur—Rancher Marcos Alvarez creates agricultural abundance with his new photovoltaic water-pumping system, installed with technical and funding assistance from Sandia.

These are just two of the approximately 250 PV and wind-energy water pumping systems, provided by Sandia's Mexico Renewable Energy Program, that are improving the lives of thousands of Mexican people living in rural areas.

"To really comprehend the world of good these innovations accomplish, you have to see the effect this technology has on the lives of people who probably haven't had electricity in their lifetimes," said Michael Ross, program manager for Sandia's Mexico Renewable Energy Program. More than 15 million people in 100,000 Mexican rural communities are in need of potable water processing capabilities, and at least 600,000 ranches need water for livestock and irrigation, he said.

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The Mexico Renewable Energy Program improves the economies of some of the poorest areas of rural Mexico. Wind and solar energy increases the profitability of small ranches, reduces pollution from traditional fuel-powered generators, and broadens the renewable energy market outside the United States.

Sandia's work in Mexico began in the early 1990s under the sponsorship of the U.S. Department of Energy's National Photovoltaics Program and the Committee on Renewable Energy, Commerce and Trade. The Program is currently cosponsored by the DOE's Office of Solar Technologies and the Mexico mission office of the U.S. Agency for International Development (USAID).

More than fifty U.S. and Mexican suppliers have worked with Sandia in renewable energy projects since 1994, when Sandia established its Mexico Renewable Energy Program. More than 400 renewable energy pilot systems have been installed in 14 Mexican states under the program, producing more than 270 kilowatts of clean, renewable power that is directly benefiting about 29,000 Mexicans living in rural areas. The program boosts U.S. job creation and sales since most of the system components are manufactured in the United States.

In addition to aiding Mexican farmers, the program supports community water supply and disinfection, telecommunications, small community electrification, solar home systems, and monitoring stations. The program

Mexican engineers discuss the recent installation of a photovoltaic water-pumping station on Rancho Sagitario in Baja California Sur, just outside of La Paz.

The goal of Sandia's Mexico Renewable Energy Program is to make the use of renewable energy systems in Mexico widespread and self-sustaining. Energy availability is a key element of security for any nation, including Mexico, said Marjorie Tatro, director of Sandia's Energy and Transportation Security Center. And that ultimately will benefit the United States, she added.

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enhances U.S. national security because it helps to stabilize the flow of rural migration to Mexico's urban areas and into the United States.

One of the leading partnerships is the Renewable Energy for Agriculture Program managed by Mexico's Fideicomiso de Riesgo Compartido (FIRCO), an agricultural extension service under the Mexican Ministry of Agriculture. FIRCO plans to bring 1,200 new PV systems and 55 wind systems to isolated areas of Mexico over a five-year period. The systems will be used for such things as pumping water and creating electricity for refrigeration.

Sandia's expertise and involvement goes beyond design and development of renewable-energy systems. Engineers help write system specifications and they frequently help install the systems and teach local organizations, users, and vendors how to install, operate, and maintain the systems.

Sandia also helps Mexican ranchers find financing for the systems. When used in productive applications such as water pumping, the systems pay for themselves relatively quickly compared to other conventional energy generators, Ross said.

Sandia National Laboratories renewable energy expert Michael Ross works on a photovoltaic water-pumping system at a ranch near Cancún on Mexico's Yucatán peninsula.