

Renewable Energy for Agriculture

Location: Rural Mexico
Type: Rural agricultural development
Size: 1,152 photovoltaic (PV) water pumping projects;
 55 demonstration wind-water pumping systems
Funding: Total: US\$31,000,000
 Private: US\$7,750,000
 Public: US\$23,250,000
Objective: To increase the capacity of small ranchers and farmers to operate in an environmentally friendly manner.
Duration: 2000–2004
Scale: Rural

Summary

Through the program, more than 1,000 engineers, technicians, and agricultural extensionists throughout Mexico are receiving training in the appropriate use of renewable energy technologies for ranching and farming. More than 1,000 demonstration projects are scheduled for installation, and more than 10,000 rural producers are expected to benefit from the program, which will result in a strong and growing private market for renewable energy technologies in the agricultural sector.

In-Country Principles That Attracted Nondonor Financing

- Capacity building and informed decision making
- Public participation in, and support of, sustainable development
- Institution building and access to justice and enforcement of laws



The Government of Mexico has demonstrated the capabilities and the institutional arrangements, including appropriate independent evaluation and oversight, necessary to implement and manage this project.

The program is highly decentralized, with activities underway in each of Mexico's 32 states. Thus outreach and education of the local participants are key to its success and long-term sustainability. Such outreach and education, although focused on empowering local people to make decisions related to their own energy and water use, also provide a structure for increased democratization in rural areas, which is often reinforced by the need to make decisions at a community level.

Capacity-building activities that have helped foster the implementation of commercial standards, thereby helping to attract private financing, include the formation of a management team independent of the government, hiring or developing staff with appropriate skills matched to the job, installing management information systems, and keeping financial records in line with international accounting standards.

Strengthened institutional structures resulting from the creation and definition of competitive markets and the management of private-sector involvement also have helped attract private investment.

Financing

Total project investment from all sources is about US\$31,000,000. Roughly 25% (US\$7,750,000) will come from the Mexican private sector. The Government of Mexico, through World Bank financing, contributed half of the funding (US\$15,500,000).

The Global Environment Facility (GEF) contributed US\$7,750,000. United States (US) investment in the pilot phase of the project, which eventually led to the GEF funding, included roughly US\$5,000,000 from the US Department of Energy (USDOE) and US\$6,000,000 from the US Agency for International Development (USAID). The Mexican private sector contributed US\$2,500,000 to the pilot phase.

The Project

In 1994, USAID and the USDOE began collaborating with Fideicomiso de Riesgo Compartido (FIRCO), the Mexican implementing agency, and local suppliers to introduce renewable energy technologies. Under the "Mexico Renewable Energy Program" (MREP), more than 200 PV water pumping projects were installed in 12 Mexican states,

principally for livestock watering on ranches. FIRCO and the Secretariat of Agriculture are now implementing a nationwide program with a World Bank loan and a GEF grant to facilitate the use of renewable energy technologies to power water-pumping and other agriculture systems.

Benefits for ranchers and farmers and their families range from improved nutrition to more sustainable irrigation.

Over the long term, renewable energy systems are typically less expensive than conventional systems. They result in fewer pollutants than the diesel and gas-powered pumps they replace, and they reduce emissions of greenhouse gases. Operations and maintenance requirements of renewable systems consume less time, thus allowing ranchers and farmers to engage in more productive activities. This shift can lead to the development of new industries in various sectors, serving numerous end uses.

Technical Data

Solar PV and wind electric systems for water pumping for small irrigation and livestock include appropriately sized, renewable energy technologies and systems that utilize groundwater in a sustainable fashion.

Performance Data

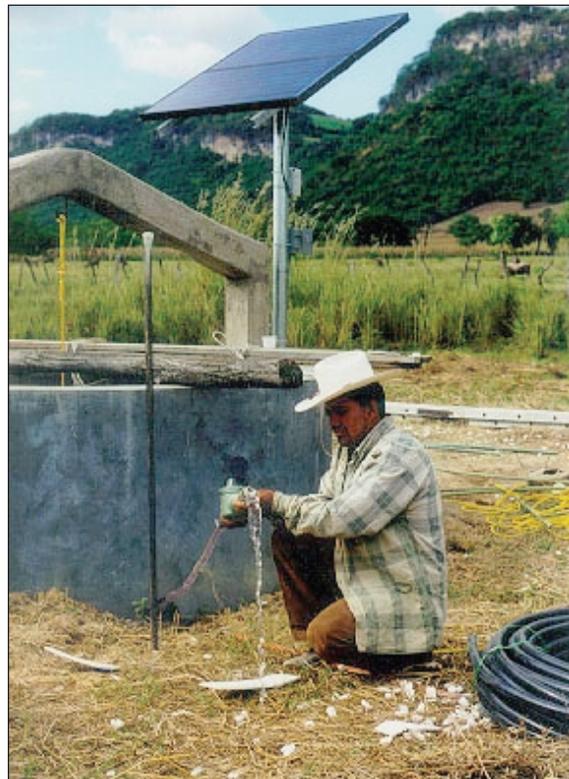
More than 450 engineers and technicians have been trained in project implementation, including private- and public-sector implementers.

The program has produced more than 28,000 direct and indirect beneficiaries, including ranchers and farmers, other community members, and system suppliers.

Participants and Roles

USAID and the USDOE provided funding during the pilot phase through premarket investment in demonstrating the feasibility of the technologies. Sandia National Laboratories has managed the program, and the USDOE's National Renewable Energy Laboratory (NREL) has helped implement the program.

Other partners include FIRCO, Secretariat of Agriculture, Mexico, World Bank, GEF, Winrock International, New Mexico State University, Enersol Associates, and Ecoturismo y Nuevas Tecnologías.



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