

**Renewable Energy for NGOs in Protected Areas Management:
A Preliminary Evaluation of USAID/Mexico--DOE support
for the Mexico Ecodevelopment Program
of the World Wildlife Fund**

by

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ABSTRACT

This thesis provides a preliminary evaluation of the experiences and impacts to date of a three-year USAID/Mexico—Department of Energy (DOE) program component that seeks to facilitate conservation efforts in Mexico through the adoption of small-scale renewable energy technology by conservation NGOs in southeastern Mexico. The two renewable energy projects evaluated were implemented through collaboration between a technical team of DOE's Sandia National Laboratories, the World Wildlife Fund (WWF), and two Mexican partner NGOs supported under WWF's Mexico Ecodevelopment Program. Funded primarily by monies appropriated for combating global climate change, these NGOs work in and around two of the most important centers of biological diversity in Mexico, designated as official protected areas to reduce threats to biodiversity and global climate change due to deforestation. WWF's program integrates local development needs into its conservation strategy, recognizing that long-term conservation cannot occur if local populations do not have the understanding or the economic stability to be environmental stewards. The objective of the renewable energy program is to assist the international and local conservation NGOs in their efforts to combat deforestation and other degrading land practices while improving the quality of life for the populations living within the "buffer zones" around the protected areas.

The central question addressed by this thesis is: Under what circumstances can international renewable energy programs assist conservation NGOs achieve their objectives? In addressing this question, I evaluate in what ways, and to what extent the USAID/Mexico--DOE renewable energy program has thus far assisted in supporting the conservation and development objectives of WWF and the local NGOs, as well as possible longer-term impacts from the program. In this light, I investigate the ways in which the program has influenced WWF's and the local NGOs' energy decision-making processes and whether WWF foresees implementing additional renewable energy projects as a result. Finally, I explore what can be learned from this program about measures that might be appropriate for evaluating the full impact of renewable energy projects in conservation efforts.

This evaluation is based on my cumulative experiences between July, 1993 and April, 1996 working closely with WWF and local NGO personnel, including over six months in Mexico developing and implementing projects with WWF, TNC, CI, and other local partners. The observations were drawn from a combination of my direct field experience and that of four other Sandia team members, and anecdotal information gathered in meetings, workshops and interviews. The results and conclusions are necessarily preliminary in nature because the renewable energy program is still in progress, and many of the impacts may take years to be manifest.

In evaluating the two projects, I find evidence that the renewable energy program has assisted, and will continue to assist, WWF and the local NGOs (LNGOs) in achieving their conservation objectives. The renewable energy systems installed have fostered significant improvements in the infrastructural foundation of the NGOs, have created immediate improvements in quality of life, and have built local awareness of renewable energy options as well as technical capacity for making informed energy choices. However, the process of developing the projects and transferring technical capacity required much more time and effort than had been anticipated by the Sandia program implementation team. I also find that while there is evidence that WWF and the LNGOs will be more deliberate in making energy choices as a result of this experience, it is unclear whether either WWF or the LNGOs will invest in additional renewable energy systems in the future due to short-term cost constraints that drive WWF's project prioritization. Based on these findings, I argue that the indicators of "CO₂ emissions avoided" and "kW installed capacity", commonly used to measure the environmental impact of large renewable energy programs, do not adequately reflect the programs' full impact on sustainable development and natural resource management.