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Renewable Energy for Sustainable Rural Economic Development

Title: Increased Use of Renewable Energy Resources Program
Program Area: Rural Energy
Implementer: Winrock International
Geographic Focus: Global
Priority Countries: Brazil, Central America, Indonesia, Mexico, Nepal, Philippines, and South Africa
Duration: October 1999 – September 2004



Kenyan women steaming rice in fireless basket cooker

In Kenya, USAID, Winrock International and local partners have been working since 1998 to help women in Ngong and Rongai urban slum areas of Nairobi produce and access more efficient cookstoves and fireless basket cookers. In Kenya, Women forced to burn toxic plastics and other trash for cooking due to insufficient access to fuelwood were trained to build and construct more efficient stoves and insulated fireless cookers to save money and improve health. In doing so, the women formed their own business to sell the appliances.

Project Background

USAID has been implementing the Increased Use of Renewable Energy Resources program since 2000 in Brazil, India, Central America, Indonesia, Mexico, South Africa, Nepal, and the Philippines. The goal is to increase the use of renewable energy technologies (RETs) in USAID-assisted countries to support sustainable economic development.

The program addresses specific barriers to widespread adoption of rural energy technologies. Barriers include:

- Lack of awareness of the costs and benefits of renewable energy technologies;
- Prevalent policy bias towards fossil fuels;
- Lack of adequate financing and ability to pay; and
- Limited institutional capacity.

One additional and important barrier is the lack of sectoral specialists in understanding how RETs can be applied in their sectors, including health, education, agriculture, and information and communication technologies (ICTs). USAID targets these barriers by overcoming technical, financial, policy and institutional challenges.

Development Objective

USAID endeavors to find and initiate specific applications of RETs for development objectives of increasing productivity, generating income, and for using energy as a tool to achieve broader development objectives.

Approach

The approach of the program is to overcome technical, financial, economic, policy and institutional barriers to renewable energy (RE) development and to increase investments in commercially proven technologies. The project team consists of Winrock International and its Renewable Energy Project Support Offices (REPSOs) situated around the world. These offices are staffed with local experts, which ensure a local presence.

Activities under the program have recently focused on smaller-scale off-grid rural energy projects for application in non-energy sectors rather than the large-scale grid-connected renewable energy projects. USAID strives for increased linkages between renewable energy and other sectors including agriculture, health, water, telecommunications, trade and small industry.

Project Partners

- The Renewable Energy Support Offices (REPSOs). These local partners consist of Fundación Solar in Central America; Yayasan Bina Usaha Lingkungan (YBUL) in Indonesia; and Preferred Energy Inc. (PEI) in the Philippines. REPSO capabilities also exist with Solar



Solar power for remote communities in the Autonomous Region of Muslim Mindanao (ARMM).

In the Philippines, USAID is developing off grid renewable energy systems in 160 remote rural communities in the Autonomous Region in Muslim Mindanao, through the Alliance for Mindanao Off-Grid Renewable Energy (AMORE). Through solar-powered battery charging stations and individual batteries for households and public facilities, residents are now saving 70% each month of what they used to spend on kerosene for light. Residents have increased opportunities for productive activities such as mat weaving, sewing, extension of 'daylight' hours for study time and household work.

Engineering Services (SES) of Johannesburg, South Africa and are being developed within a local NGO in the Mexican Rural Development Foundation (FMDR).

- Center for Resource Solutions (CRS) contributes extensive expertise in the RE policy arena.
- The Environmental Enterprises Assistance Fund (EEAF) has brought extensive capabilities in project financing and access to commercial bank collaborators.
- Enersol/SOLUZ/Global Transition Consultants (GTC), Alternative Energy Development (AED/IRG), the Florida Solar Energy Center (FSEC), and New Mexico State University/Southwest Technology Department Institute (NMSU/SWTDI) have supported hundreds of RE projects both domestically and internationally to promote technology transfer linkages between US and overseas counterparts.
- Global Energy Concepts (GEC) --a leading consulting firm for the wind generation industry, provides support for wind power projects.
- Global Village Energy Partnership and the Energy and Security Group provide support in the area of productive and social applications for renewable energy technologies and in project finance in order to enhance economic and social development in USAID-assisted countries.




Solar power for the community of Maphephetheni, KwaZulu/Natal, South Africa.

In South Africa, USAID assistance brought a computer lab and Internet access to the Myeka High School in KwaZulu-Natal. Through photovoltaic electrification, the school now has a computer center set-up, TV/satellite/ Internet installation, and a solar powered cellular telephone. There are now over 500 computer users at the school. School attendance has risen and the dropout rate has declined.

Project Activities

The project is composed of both cross-cutting and country specific activities. Country-specific rural energy programs are being implemented in Brazil, Central America with focus on Guatemala, India, Indonesia, Mexico, Nepal, the Philippines and South Africa. Cross-cutting activities include: Adopting and Implementing Policy/Regulatory Changes; Mobilizing Business Entities to Pursue Renewable Energy; Increasing Financial Commitments; Establishing or Strengthening Host Country Non-profit Institutions; Supporting Climate Technology Cooperation (CTC) Partnerships; Supporting Global Village



Energy Partnerships (GVEP); and undertaking activities in Household Energy and Indoor Air Quality.

Project Results

Since it began in 1999, the program has had a role in the installation of:

- 217MW of on-grid capacity, 64,000 off-grid systems;
- 20 policies/regulations impacted favorable to renewables;
- 135 businesses mobilized or joint-ventures formed;
- over US\$600 million in new financial commitments; and
- 165 host-country NGOs and PVOs established or strengthened.

Development Impact

The program has had a wide development impact since its inception in 2000.

Hundreds of families have been lifted from poverty through the use of energy to start businesses, increase agricultural output, and increase trade. Specific projects have brought lighting for commercial enterprises to extend business hours, improved agricultural productivity by providing energy to pump irrigation water during the dry season, solar energy for crop and fish drying for reducing spoilage, and use of wood wastes for powering sawmills.

The program has made energy available for rural areas for operating small industries such as carpentry shops and

metal shops, energy for lighting rural hotels, energy for Information and Communications Technologies (ICT) such as solar/satellite phones and computers with web-access for selling locally-manufactured products.

Projects have provided energy to support social services such as refrigeration for preserving vaccines in rural health clinics and lighting and winter heat for schools to enhance enrollment and educational effectiveness.

In addition, program activities have allowed for quality-of-life enhancements through the provision of water for household use and lighting from PV systems.

Lessons Learned

- Renewables do not need to “compete” with bigger ticket fossil fuels such as oil, gas and coal. Often renewables have a niche in rural areas that are off the grid and for the most part have little or no available electricity.
- Focus on the provision of energy not solely for the sake of installing units or MW, but for providing energy for certain productive uses and for income generation, and across non-energy sectors.
- Communities need to be involved, ownership needs to be established, maintenance and operations need to be provided and in most cases provisions need to be made to keep the systems safe and secure. It is also helpful to have community technology



demonstrations to show how the systems work and highlight the benefits and how they can be obtained, etc. But most importantly the project must help communities understand how they can help themselves.

- Look at project opportunities where there is an ability to pay for power. Or if there is limited ability to pay, find ways to help the communities (e.g., farmers, fisherman) obtain the needed credit. Up-front capital needs are often a barrier, particularly in rural areas of developing countries where the average income is around US\$500 per year. Provisions need to be made for finding or providing micro-credit and interest rate buy-downs and local micro-enterprises need to be nurtured and trained to help commercialize RE programs.

- Financing institutions need to be educated about the nature of, and future potential of RETs - particularly local and regional commercial banks. The lack of awareness about and understanding of, RETs can stifle lending. Conversely, increased knowledge about these technologies can stimulate investment and lending.
- It is often difficult to introduce US companies to certain international markets, where perhaps they had not previously ventured. Obstacles of distance, language and cultural differences exist that can prevent US companies from doing business in certain developing countries. The program has effectively utilized its in-country partners to match local companies/entities with US or other international developers and companies.

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