

PROJECT BRIEF

The Ramakrishna Mission PV Project—A Cooperation Between India and the United States

by Jack L. Stone and Harin S. Ullal 12/97

Background

The Sustainable Rural Economic Development Ramakrishna Mission PV Initiative was conceived as a small-scale demonstration project that would show the economic viability of photovoltaic (PV) systems in the Sundarbans region of West Bengal. The viability was dependent on the systems being economical without substantial subsidy and eventually without any subsidy at all. The operation and maintenance of the systems were the responsibility of the chosen non-government organization, the Ramakrishna Mission. Mission personnel were to identify beneficiaries of the PV systems, define a financing arrangement that would be acceptable and sustainable to the villagers of the region, and serve as a banker to collect revenues from the end users.

The potential for expanding the project beyond the limited demonstration was also a prime consideration. With U.S. systems used for the installations, our industry would also have the advantage of satisfying any future PV system purchases. The cooperative nature of the project would also be expected to lead to improved relationships between our two countries and further trade expansion. The project was also designed to reflect market forces or true costs.

Without excessive subsidies, and with end-user money required for participation, the systems were expected to have the best of care. Most importantly, the benefits of electricity would be made available to those who had little or no access in the past. Improvements in educational opportunities, health care, productivity, and entrepreneurship would be standards for success of the project. Finally, the project would be self-sustaining. An infrastructure would remain to support additional applications including financing, education, training, repair, and maintenance. Successful deployment of the project would pave the way for acceptance of renewable technologies as a means for providing the benefits energy to the developing world.

Scope

Several villages and various applications were identified for participation in the project. In the village of Gosaba (with 1000 families), the training center will receive ten lights for 4 hours of operation each night, two 30-watt wall sockets, a battery-charging station for ten 100-Ah batteries and twenty solar lanterns, and three stand-alone street lights with 11-watt compact fluorescent (CFL) lamps. The possibility of mounting the charger station on one of the Mission's boats will be investigated. This would allow the service to be transported throughout the island communities. The village of Katakali, with 100 families, will be provided 100 domestic lighting units with one 11-watt CFL and one 30-watt socket for each home. The youth club will have two 11-watt CFLs and one 30-watt wall socket. In the village of Pakhirala, the weaving center will receive three 11-watt CFLs, a community street light and eight 11-watt CFLs with two 30-watt wall sockets. The electricity for the weaving center will extend production hours by about four per night.

The health clinic in Satyanaryanpur will receive a vaccine refrigerator and eight 11-watt CFLs with two 30-watt electrical sockets. A second battery-charging station for ten 100 amp-hour car batteries will be placed at the Chota Mollakhali youth center. The village of Kumirmari will have 100 home lighting systems installed. The village of Satjelia will be furnished 100 domestic home lighting systems, each with a 9-watt CFL and a 30-watt electrical socket.

A two-week training program will be offered to participants chosen by the Mission for their background in basic electrical applications, including radio and television repair. The Mission has a very good reputation for providing high-quality training. Remote Power International prepared a detailed training manual that will be used by the Mission after trainers funded by the National Renewable Energy Laboratory (NREL) leave. The last week of training will be hands-on installation in the island communities. Applied Power Corporation, the prime contractor for the project, has prepared detailed schematics and installation procedures for all of the proposed systems.

Project Responsibilities

The agreement calls for 50-50 cost sharing with the United States providing the PV modules, charge controllers, a water pump, and training. India provides the batteries, compact fluorescent lamps, lamp fixtures, a vaccine refrigerator, mounting structures, all balance-of-systems components, solar lanterns, and pays all custom duties for imported components. The Ramakrishna Mission is responsible for identifying recipients of the various systems and participants in the NREL training sessions. The Mission will do follow-up training, maintenance and replacement, and serve as the collector of revenues from the end users. NREL will help the Mission to identify potential private sector partners with whom proposals will be submitted to IREDA to expand the project beyond this initiative.

Project Financing

In India, the domestic unit of two lights plus one wall socket along with the necessary PV panel, battery, and accessories cost approximately Rs. 14,000 (\$1 = Rs. 35). With Rs. 6,000 available as a government subsidy, the amount to be borne by the user is Rs. 8,000 per unit. The end user will provide a down payment of Rs. 3,500 upon installation. The balance (Rs. 4,500) will be treated as a low-interest loan to be repaid in monthly installments of Rs. 40 per month over 10 years. In this way Rs. 40 x 12 months x 10 years or Rs. 4,800 will be realized-Rs. 4,500 against the loan and Rs. 300 as interest. In addition, Rs. 20 per month will be charged for maintenance charges on each unit and the costs for spares will be at the owner's expense. Thus the users will pay a total of Rs. 60 per month for 10 years. They may also opt to pay Rs. 100 per month (80+20) for five years. Some special category participants, who are not in a position to make the Rs. 3,500 down payment, will need only Rs. 500 down with the balance treated as a loan to be repaid in five to ten years. After the loan is liquidated, ownership will transfer to the users. The amount recovered from the end users' down payments and loan interest will form a Revolving Fund for the project, which in turn will be used to replicate the program to other villages and for other participants in the same village.

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