

resources to develop and operate programs, and to carry out projects, are equally important. PV systems and their implementation in rural areas are frequently looked upon in a very simplistic manner by a number of people. However, disregard for the complexities behind the process has resulted in a large number of failures. One would be surprised to learn how many PV projects in rural areas around the world have not lasted but a few years beyond the inauguration date; or how many others are still not complete because a variety of logistic aspects were not given due consideration at project inception; or even how many others are under-performing as a result of faulty engineering and construction practices. Unfortunately, little reliable information from the field is available in this respect as many projects are in their first years of operation so it would be too early to draw any definite conclusions about them.

PV systems packaging is increasingly being carried out by local companies in the developing countries. This practice has its merits, since it promotes the use of local labor and materials, which benefits the local economy. However, workers are not always properly trained to carry out their duties, so that construction and installation guidelines, no matter how precise and elaborate, are not always followed. Sometimes instruction materials are not in the local language, or are translated incorrectly, and at other times they do not properly match the idiosyncratic framework of the local worker. The benefits of training local workers for industry support cannot be overstressed. An example of how far this training could go can be found in the project carried out by the Spanish Cooperation in Bolivia, where native Aymara Indians were successfully trained to assemble electronic charge controllers for SHS. This project is described in greater detail below [32].

Local distributors and vendors of PV systems frequently lack a proper understanding of the products they sell. This leads more often than not to undersized systems, to make the sale easier, or to overselling the attributes of the PV systems to be sold, creating customer expectations beyond the actual capabilities of the system. In any case, the result is customer dissatisfaction. Thus, for the PV business to grow on solid bases, the front-lines that deal with end users must be properly trained in technical, marketing, selling and business practices. This is easier said than done, as many PV businesses in developing countries are small commercial ventures embedded in other lines of activity, such as hardware stores or cattle feed stores.

Photovoltaics being a novel technology for most people, developing and implementing programs for its massive deployment is not necessarily an easy task for program managers. Assistance is oftentimes required for program formulation, and to establish the proper mechanisms for project financing, implementation and monitoring. Multilateral agencies such as the World Bank, the GEF, UNDP and others, organize workshops and seminars around the globe to disseminate best practices that could help solve this problem. Over the past six years, the Network for Rural Electrification with Renewable Energy (RIER) of the Ibero American Program of Science and Technology for Development (CYTED) has been running courses and workshops on strategies for PV rural electrification throughout Latin America. Attendees usually include officials from government agencies in charge of rural electrification, electric utilities, local financing organizations, PV distributors and salespeople, and university professors. Benefits from such training activities often translate into better-formulated programs and projects, and a more appropriate understanding of the critical elements to make PV rural electrification projects sustainable.