

conditions and the quality of life of the population. The original objective of the program was to provide electrical services to 100 000 households in a time span of five years by means of renewable energy. The process to carry out this task is based on sustainability, by creating an appropriate institutional, financial and technological framework. This program has been under implementation since 1997, supported by an UNDP-GEF grant. The first phase of the program has the goal of installing 3200 SHS through 22 projects in five municipalities and is aimed at removing financial, institutional, technical and human resource barriers to the massive application of photovoltaics.

Bolivia has been a favorite place for international cooperation in the field of PV rural electrification. In 1988, the Spanish Agency for International Cooperation and the Solar Energy Institute of the Polytechnic University of Madrid launched a PV electrification project to bring electricity to the Aymara community in the high Bolivian plateau. Beyond the traditional objectives of a project of this kind, this particular project attempted to foster the development of a users' organization with capabilities to manage and maintain PV installations, and to be responsible for the proper continuation of the project. At the same time, emphasis was put on the creation of an industrial unit in one of the rural communities to manufacture balance of system components using local manpower and Bolivian components as a basis for future projects [39]. By 1993, a total of 1000 SHS had already been installed and the Association for Solar Electrification (AES) had been created. AES included all PV users and was the owner of all the PV installations. An accounting system was established and a team of installers and maintenance crews was trained. This project has been studied thoroughly and important lessons derived thereof [32]. By the end of its fifth year of operation, a demand for about 30 000 SHS had been created, well beyond the financial capabilities of the project. Unfortunately, several problems in the area of financial management developed within the AES once the main implementing agents pulled out from the country and the project stalled.

In another action, the US-based National Rural Electric Cooperatives Association (NRECA, now an incorporated company) launched several pilot PV projects in Bolivia to test different financial schemes. In cooperation with the local organization Rural Electricity Cooperative (CRE), 90 SHS were installed as a preamble to a further 1300 installations. CRE provided complementary financing for the purchase of the PV systems and managed other aspects of project implementation, including the selection of the users and providing technical training [40]. In cooperation with the Cochabamba Electric Company, a privately owned electricity distribution company, NRECA implemented another project to install 300 SHS in remote rural communities. ELFEC finances the purchase of the equipment and provides installation and maintenance services.

The project INTI K'ANCHAY (light from the sun) has been implemented by the local NGO Energética with financial support from the Netherlands. Five hundred SHS were to be installed in the first phase, to test a financing mechanism that eventually could be extended to cover a larger portion of the 150 000 families without electricity in the province of Carrasco [41]. Companies participating in the process are required, among other things, to supply and install the SHS according to technical norms and specifications issued by Energética, to provide guarantees according to the useful life of the individual components and to build a network of representatives at the microregion level for after-sales service. By July 1999, a total of 200 SHS had already been installed, and applications for 350 more were being processed [42].