

DECENTRALISED PHOTOVOLTAIC ELECTRIFICATION IN MOROCCO KfW/ ONE 1999 - 2007

Background

The ongoing project of the OFFICE NATIONAL DE L'ELECTRICITÉ (ONE) in the Kingdom of Morocco, in cooperation with the German Bank for Financial Cooperation - the KfW Entwicklungsbank - is being carried out by an international consortium comprised of : PROJEKT-CONSULT GmbH (Germany), ENTEC AG (Switzerland) and RESING (Morocco).



Four project provinces:

- Khouribga;
- Khémisset,
- Khénifra
- Settat

The problem of rural electrification in Morocco

By end of 1999, only about 40 % people living in rural areas of Morocco could benefit from the electricity supply while 60 % of all Moroccan rural households remained at home in the dark.

In order to accelerate rural electrification throughout the entire country, the national utility, ONE, is implementing the PERG programme, which intends to have 80% of rural homes connected to the national network by the year 2006.

Within the framework of the PERG rural electrification programme, the ONE-KfW project aims to take advantage of a local and renewable power resource: solar energy. The installation of 16,000 *Solar Home Systems* is scheduled within five years in selected provinces (see map).

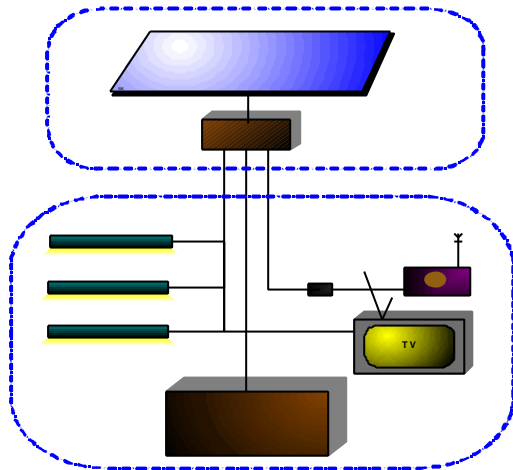
The technology of individual systems

Because of the elevated costs in connecting rural households to the electricity grid, grid extension is not feasible, and so another approach for the supply of electricity for people living in remote areas is needed. The individual photovoltaic *Solar Home System* (SHS) is the best choice: Within a SHS, a PV panel generates enough electricity to power several electric lights and a b/w TV set. The system works autonomously and does not need fuel: the light of the sun is transformed directly into electric power, which is then accumulated into a lead-acid battery, and this finds use mainly during the dark hours.

The strategy of the project

The strategy of the project is based on getting the private sector to participate to the utmost in order to assure that the systems installed are well sustained, and as well, to stimulate a sense of more participation and responsibility in the Moroccan private PV sector.

So therefore, a qualified service company, identified in an international tender carried out by ONE, is installing three types of SHS in order to meet different needs and level of the rural population: SHS with 50 Wp, 75 Wp and 100 Wp. In order to assure quality of services and hardware the consultant on behalf of ONE is carrying out quality control on different levels (laboratory tests, factory and storage control visits); finally the Consultant together with representatives of the local agency of ONE will carry out provisional



Scheme of a Solar Home System

and final acceptance procedures of the installed systems in the selected provinces (see map). At the same time, the company in that region will maintain its after-sales service at all times with local shops and technicians available. So there is a guarantee that the systems can be kept constantly operational; in cases where a technical problem might arise, a technician can be on the spot, at the latest, within 48 hours of being called.

The financial terms

The economic approach of the project is being modelled on the PERG scheme for the conventional grid extension: the interested household is asked to pay an advance depending on the size of the SHS (between 700 and 3100 DH*). Latest 2 weeks after signature of the clients contract and advance payment, installation has to follow. The monthly payment again depends on the size of the system installed and can be 65 DH (50 Wp), 96 DH (75 Wp) or 129 DH (100 Wp) per household for ten years, with after-sales service included.

All arrangements with the end-user are made by the private service company, which is TEMASOL, the Moroccan representative of TOTAL ENERGIE, on behalf of, and supervised by, the ONE regional office.

* 1 Euro = 10.6 DH (January 2003)

Quality assurance

A key concern of the project is that of quality assurance, both for the technology and the service offered. During all phases of the project extensive measures on quality control are carried out, including laboratory tests as well as supervision in the field. Therefore high quality and guaranteed performance of the equipment, as well as the ability to offer the requested after-sales-service, are essential requirements for the selection of the qualified service company made by ONE.

By implementing these measures, potential problems like:

- unreliable services (black-out, low efficiency etc.) and
- unacceptable costs for repair and replacements

can be avoided from the very beginning and the original investment in the systems will remain feasible and efficient.

The project developers themselves are convinced that the selection of high-quality components and the establishment of a customer-friendly, close at-hand after-sales service network, are key issues for giving the best service to customers in rural areas.

Project implementation

Installations of Solar Home Systems under the Fee-For-Service approach did start in December 2002. It is intended to install in the first year 2000 SHS, 5000 SHS in the 2nd year, 7000 in the 3rd year and 2000 SHS in the 4th year of the project – in contrast to this estimation at the end of the second year 7594 systems have been installed.

The service company guarantees O&M services for 10 years after installation.



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