

## Project Summary

### Project Background

Pakistan is a net importer of energy, spending \$3 billion a year, equivalent to about 30 % of total imports, to import oil to meet its energy needs. Most of this energy is for electricity generation. Over 70 % of Pakistan's electricity comes from thermal sources, approx. 30 % from large hydro, and less than 1 % from renewable and other sources. Even with all this imported energy, Pakistan faces a 20 % power shortage. To address the energy shortage and as part of its decentralization policy, the government decided to put greater emphasis on RE. It established the Alternative Energy Development Board (AEDB) as the apex organization to coordinate RE promotion.

### Project Objectives

The objective of the action was to "prepare a project to develop indigenous, non-polluting, and renewable sources of energy to help meet Pakistan's power shortage and improve the quality and reliability of the power system, especially in rural areas". Main outputs were 12 preparatory studies, namely

- the analysis of the RE potential of four selected provinces and
- feasibility studies of 8 selected projects to be financed under the ensuing loan.

Furthermore, several of the hydropower stations are currently being constructed following tenders by the provincial governments.

### Project Activities

Project activities were clustered under two components:

Component 1 contained the analysis of the potential in four provinces, with different emphasis on various RE sources (wind, solar, small hydro and hybrid systems) in each province.

Component 2 involved the identification of suitable subproject sites and the preparation of feasibility studies for 8 subprojects. Eight small hydropower projects were selected and comprehensive feasibility studies undertaken. The feasibility studies included comprehensive technical, economical, financial, environmental and social analyses. The social analyses also included resettlement and indigenous peoples studies for several sites. The subprojects included Chianwali (5.4 MW), Deg Outfall (5 MW), Machai (2.6 MW), Okara (4 MW), Marala (7.2 MW), Pakpattan Canal (3.2 MW) run of river projects; and Daral Khwar (36.6 MW) and Ranolia (11.5 MW) high head hydropower projects in NWFP and Punjab provinces. A methodology and approach for conducting feasibility was condensed in a handbook that serves as a guide for ADB to select projects for financing in Pakistan. It also serves as a guideline for the environmental and socio-economic assessment by the government agencies at the local level.

### Implementation Features

Based on the analyses in the four provinces, the consultant team, jointly with the implementing agencies, developed a priority list of subprojects (2 each province). These were selected by least-cost analysis for power system expansion, consistent with ADB's energy policy. The studies also considered alternatives, including conventional energy sources.

## Services Provided

- Analyses of RE potentials in Balochistan, NWFP, Punjab and Sindh provinces
- Prioritisation and selection of 8 sub-projects
- Feasibility studies for eight small hydropower projects (2 to 36 MW) including technical, economical, financial, environmental and social analyses
- Model feasibility studies for future application

## Pakistan

### Renewable Energy Development Project

#### Client

Asian Development Bank (ADB)

#### Duration

05/2005 - 12/2006

#### Personnel

- 17 PM of international STE
  - Hydropower engineer
  - RE specialist
  - Energy economist
  - Environmental specialist
  - Social development specialist
- 40 PM of national STE in the above techn. Areas

