

CHAPTER TEN

ENERGY

Energy and Poverty Reduction

Energy and poverty are directly related. People living in poverty depend on wood, dung and other biomass fuels. The associated in-door air pollution diminishes the quality of life. Traditional energy sources have lower energy efficiencies and are labour intensive to obtain. This disadvantages poor households who depend on it. Increasing accessibility of the majority of the population to modern energy services and efficient devices leads to the improvement of living conditions.

In order to contribute to poverty alleviation, programs in the energy sector should aim at:

- a) Increasing access to electricity for the purpose of enhancing social and economic development through higher economic productivity in agriculture, etc.
- b) Promoting efficient utilisation of biomass energy technologies, especially for the low and medium income groups in order to save their time and money.
- c) Promoting the wider utilization of alternative energy resources such as coal briquettes and renewable sources to reduce poverty and land degradation.

Role of Energy in Economic Growth

While measures on energy can be designed specifically for the poor, an equally important goal is efficient provision of energy to industry to generate resources for re-investment in energy and other sectors for benefit to the poor. The role of energy in the national economy includes the following aspects:

1. Energy is a critical input to many if not all production processes such as agriculture, mining, manufacturing, transport, tourism and others.
2. Provision and creating of employment
3. Both the modern and tradition ways of energy production contribute to employment in Zambia. The electricity and petroleum sub-sectors directly employ about 6,000 people. The charcoal industry annually employs about 60,000 people.
4. Earning of foreign exchange

Energy Sector Policy Framework

In 1994, the government formulated a National Energy Policy (NEP). Its main objective is “to promote optimum supply and utilisation of energy, especially indigenous forms, to facilitate the socio-economic development of the country and maintenance of a safe and health environment”. Broadly, the policy in energy sub-sectors are defined as follows:

- ❑ **Electricity:** The overall policy objective is to increase accessibility to electricity as well as developing the most cost effective sites for the domestic and export market.
- ❑ **Petroleum:** Since petroleum is wholly imported the policy is to supply and utilise it in the most efficient and cost effective manner.

- ❑ **Coal:** Being an indigenous energy source, the policy is to promote its use with due regard to environmental protection.
- ❑ **Wood fuel:** constitutes the largest single source of energy mainly by the household sector. The policy is to achieve a sustainable supply of wood as an energy source
- ❑ **New & Renewable Sources of Energy (NRSE):** As there is currently limited use of NRSE, the policy is to promote wider application of NRSE technologies particularly for remote and rural population.

Programmes to Enhance Poverty Reduction in the Energy Sector

Programs in the energy sector that will have a positive impact on poverty alleviation can be divided into two categories as follows:

Large-scale investment programmes

These programs aim to rehabilitate or building large energy infrastructure to provide adequate and reliable power. They include the following:

Power Rehabilitation Project

1. Rehabilitation of stations at Victoria Falls, Kafue Gorge and Kariba North Bank.
2. Rehabilitation of the ZESCO Power Transmission System, Lusaka distribution System and the Copperbelt Distribution System in Ndola and Kitwe.
3. Loss reduction in the Lusaka Area
4. Gwembe-Tonga Rehabilitation and Development Program
5. ZESCO Institutional Strengthening
6. Hydropower Development and Transmission Line Policy

The total project cost is estimated at US\$235 million and is being financed by credits from IDA, European Investment Bank, Development Bank of Southern Africa (DBSA) and grants from donors. Implementation of project activities is proceeding well.

Petroleum Rehabilitation Project

1. Rehabilitation of the TAZAMA Pipeline from Dar-Es-Salaam to Ndola including the tank farm in Dar-Es-Salaam;
2. Rehabilitation of the Fuel Terminal;
3. Creation of a Technical Cell on petroleum in the Ministry of Energy and Water Development.

The total cost of the project was estimated at US\$48 million with US\$33 million being credit from IDA and US\$15 million loan from the European Investment Bank (EIB). These credit facilities were recently cancelled thus halting further implementation. Work done prior to the cancellation includes the tank plot in Ndola.

Rural Electrification Programme

To increase accessibility to electricity, rural electrification program is being implemented and is being funded by the Rural Electrification Fund created in 1994, which comes from a levy made on electricity bills. The program now requires the development of a National Master Plan, which will identify a least cost and effective way of its implementation while incorporating new & renewable sources of energy.

Rural electrification will be planned carefully to ensure its financial sustainability. This means the prime targets for rural electrification will first and foremost be the new farming and tourist areas that will be identified. In this way, local productivity will rise and the financial viability of the electricity infrastructure will improve

Kafue Gorge Lower Hydro Electric Scheme (KGL)

The project is located 2 km downstream from the existing 900 MW Kafue Gorge Upper Power station. The project will be rated at 6000MW and will cost US\$430 million. The Office for the Promotion of Private Power Investments (OPPI) established in 1999 is currently Preparation Requests for Proposals for short listed bidders. Based on the proposals, a developer will be selected.

Itezhi-Tezhi Hydro Electric Project

This project is located on the Itezhi-Tezhi Dam along the Kafue River, some 230 km upstream of the Upper Kafue Gorge Plant and its installed capacity is estimated at 120 MW. The cost will be US\$100 million. This cost will include US\$28 million for a 200km 220kV-transmission line from Itezhi-Tezhi to Muzuma, the nearest point of interconnection to the national grid. Evaluation of bids by private developers was done in June 2000.

Zambia-Tanzania Interconnector

The Zambia-Tanzania Interconnection Project involves construction of 700 km of 330 kV transmission line, 600 km on the Zambian side and about 100 km on the Tanzanian side. The proposed line will be able to supply up to 200 MW of power at a cost of US\$153 million. Discussions between the two countries on this are under-going. Recently, Kenya indicated interest to be connected to the line. This will make the project more attractive because of a larger market.

Electrification of Mkushi Farm Block

A fresh feasibility study on how to electrify the remaining areas of the farming block will be carried out. About US\$30.6 million may be spent on the project. After the study, the project will be packaged for private sector participation.

Small-Scale Investment Programs

Small-Hydro Power Development Projects

Considerable potential exists in the North-Western part of Zambia for the development of mini-hydro power stations. Sites that are commercially viable are being offered for private sector participation. At least two viable sites have been identified.

New & Renewable Sources of Energy

Activities in this sub-sector aim at promoting the development and dissemination of viable new and renewable sources of energy technologies and this has now been incorporated in the rural electrification program to demonstrate its viability. With assistance from Sweden, the Department of Energy has launched a project that will make it easy for rural communities to access solar electricity services through Energy Service Companies (ESCOs) based in the project area. The project has since started on pilot basis in the Eastern Province.

Promoting Efficient Production and Utilisation of Wood Fuel

Activities under this program have so far involved studies of the various aspects of the charcoal industry starting with the resource base (forests), charcoal production, transportation, marketing, and distribution of charcoal. The aim is to attain sustainable use of wood fuel with due regard to its adverse effect on the environment.

The lack of access to electricity in most of the rural and urban areas has led to creation of a vicious circle of population pressure, poverty, environmental degradation, health problems, etc. In rural and urban areas, the electricity access rate is 2 percent and 35 percent respectively.

To remedy this situation, poverty alleviation strategies in the energy sector will aim to:

- ❑ Increase the electricity access rate from the current 20 percent to 50 percent by the year 2010. In rural and urban areas, this will translate to access rates of 15 percent and 70 percent respectively
- ❑ Reduce dependence on wood fuel from the current 72 percent to 45 percent by 2010.
- ❑ Increase exports of electricity to neighbouring countries by 300 percent from the current levels by 2010.