

# Global Action <sup>on</sup>Renewable Energy

GEF

# SUDAN: PROMOTING SOLAR PHOTOVOLTAIC SYSTEMS

Sudan's main energy source is biomass, mostly in traditional uses. Electricity constitutes only 2 percent of the country's energy consumption. The national electricity grid reaches a half million households, less than 10 percent of the population; major and minor local grids serve another 5 percent. Consequently, the majority of Sudanese take care of their energy needs themselves. In addition to biomass, liquefied petroleum gas and charcoal are sources of household energy. Wealthier households often invest in diesel generators.

## THE GEF SOLAR PHOTOVOLTAIC PROJECT

In 2000, the Global Environment Facility (GEF) launched a project to create a sustainable technical, institutional, and financial infrastructure to support the market penetration of solar photovoltaic (PV) systems. The project aims to meet the growing energy demand in semi-urban Sudan with PV, rather than diesel, systems. The project seeks to build capacity and awareness and to help the Sudanese government develop policies and regulations that will create an environment favorable to the use of this clean technology.

When the project began operations, PV technology, despite its potential, was little known in Sudan and was rarely used to satisfy the country's energy needs. It was mainly used in telecommunication applications and by airports, railways, and the military. The government had already undertaken some PV promotion activities with the help of donors and wanted to do more. It recognized that a range of training and outreach activities, combined with the strengthening of public institutions and, most importantly, some assistance in formulating and implementing a PV policy, was required to achieve a higher PV market penetration.

The project got a strong start when it was taken up by the Ministry of Energy, which could count on the expertise of a team of dedicated professionals. The project soon established a strong network of partnerships among the central and state governments, the Sudan Environment Conservation Society, the Energy Committee of the National Assembly, and the Energy Research Institute.



# POLICIES THAT ENABLE THE MARKET

Today, the Sudanese government is actively supporting PV policies. The solar PV project has contributed to enhanced awareness of the social and economic potential of PV power and has boosted activities by the National Energy Committee of the National Assembly to enact a Solar Energy Act. In the annual 2004 national development budget, the parliament passed a resolution exempting PV system components from import duties and the value added tax. The government has further decided to invest in a joint venture with China for a module assembly line. It is expected that the combined effects of tax reduction and local assembly will reduce PV costs by 30–40 percent.

## PROVIDING SOCIAL SERVICES POWERED BY THE SUN

In the absence of a significant private household market, the main market action for PV is in the social sector. The Sudanese government and the states have invested in PV backup systems for schools, health clinics, and community centers. The model schools have already seen improved exam results, which they attribute to greater opportunity for studying with the availability of electric light. Some schools have invested in computers now that they have reliable power.

The cost of introducing PV systems in the major social centers of 1,000 villages was incorporated into the government's most recent annual development budget. But for the later stages, the cost of systems in the social centers is expected to be covered through installment payments by the users.

#### **FINANCING**

Financing continues to be the single most important and complicated issue for a larger PV market in Sudan. Before the project, most PV sales were cash-based; vendors and banks were unwilling to provide financing to consumers or sell on credit because of the inherent financial risk and the high transaction cost of small loans. To reduce the credit risk, the project has piloted, with the Sudanese Social Development and Savings Bank (SSDSB), a guarantee mechanism, which became operational in 2003. At the end of 2003, about 80 percent of the capital provided was used to leverage credit for solar systems, mostly for household uses. The payback rate was in the range of 87–92 percent of the monthly transactions. Because of the success of this program, the Sudanese Agricultural Bank agreed in 2004 to provide credit in five additional towns, where SSDSB does not have branches.

#### NEXT STOP: THE ELECTRIC WATER PUMP

For PV-powered irrigation, the accrual of direct economic benefits is expected to make replication even easier. For thousands of small farms along the Nile, using PV pumps would be more economical than buying expensive fuel for unreliable diesel pumps. The government plans to demonstrate the advantages of PV pumps and spread the information through the State Focal Points.

#### THE FUTURE

The PV market players in Sudan are optimistic and expect increasing sales in coming years. The government and private businesses are hoping for falling PV costs resulting from proposed PV policies and from manufacturing by local firms. They anticipate increased demand from social institutions and private households as they become fully aware of PV's benefits. If that happens, the project, which has been extended until the end of 2004, will have truly contributed to removing barriers to a larger PV market.

#### FOR MORE INFORMATION

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