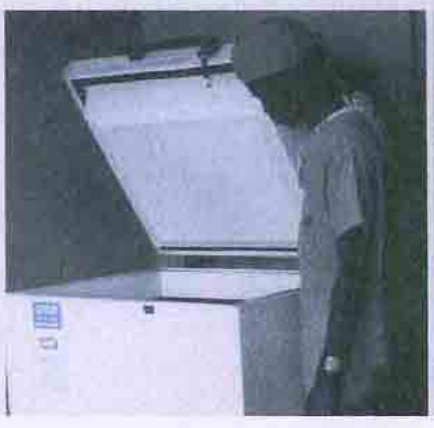
WORLD VIEW

Zaire, famous for the River Congo, mountain gorillas and overflowing diamond mines, is also a mine of renewable energy. As Jean-Paul Loineau of IT Power's Zairean Office reports, the renewables are helping this Central African country to improve its health conditions.

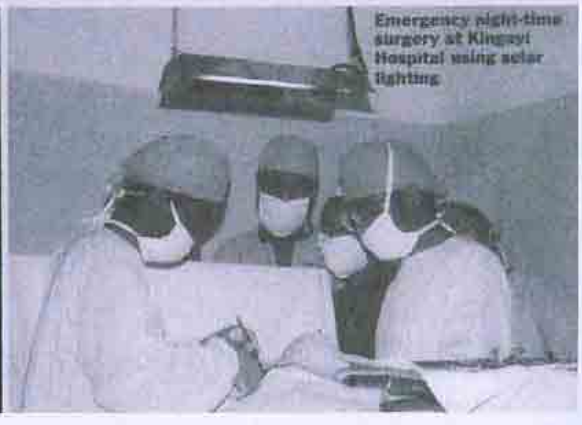
Straddling the Equator, Zaire is a vast country nine times larger than the UK. About 33 million people live in this densely-forested land, enriched both by minerals (copper, cobalt and diamonds) and by natural vegetation with immense agricultural potential. The renewable energy resources are tremendous and widely utilised. The average solar irradiation is quite high (4.58kWh/m^2/day on a horizontal surface – twice the UK figure).

The sun's energy is used primarily in the ancestral drying process of the staple food, manioc, and in a more modern way with photovoltaic (PV) systems. While biomass, mostly wood and charcoal, is largely used for cooking, 99.6% of the electricity produced in Zaire comes from hydro power. This electricity, however, is consumed by only 170,000 people concentrated in the two largest cities, the capital Kinshasa and Lubumbashi.

One of the goals of the Zairean government is to improve environmental health conditions as well as basic health services. To achieve this it has adopted a strategy outlined by the World Health Organisation (WHO) which focuses on primary health care. Within this framework, WHO's Expanded Programme of Immunisation has made significant progress in controlling the spread of targeted diseases, but is hindered by the unreliability of refrigeration facilities, the most important link in the vaccination process. In rural areas, there is no electricity grid and fuel is often in short supply, not to mention unaffordable. For more than 20 years, PV systems, first introduced by Belgian missionaries, have proved the only way



Solar refrigerator, Nselo Hospital



Emergency night-time surgery at Kingayi Hospital using solar lighting

ZAIRE

to provide a small but reliable supply of necessary electricity.

In 1985, the Zairean Ministry of Health launched an important programme to equip health centres and medical staff accommodation with PV systems to be used for vaccine storage and lighting. Among other things, the programme aimed to improve rural working and living conditions which would encourage doctors and nurses to accept posts.

Within this framework, in 1984, the European Development Fund finalised funding for the world's largest rural health care project to utilise PV. 750 lighting and 100 refrigeration solar systems were to be installed in the Republic of Zaire. Since then, IT Power has been providing technical assistance for this project, which covers five of Zaire's 12 regions. This has included not only testing the systems, but also system installation, maintenance and the training of users for the Ministry of Health. Installation was completed, usually under rugged conditions, by September 1990.

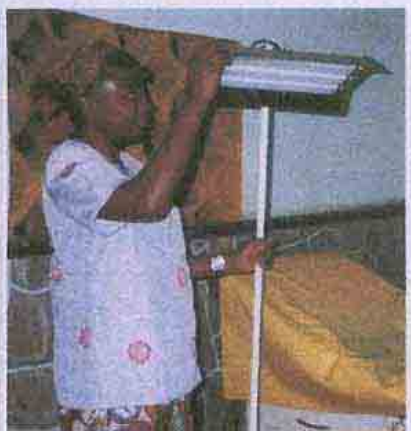
The project's many positive results are principally due to the strict respect paid to the installation standards written in the technical specifications, and to the permanent on-site presence of trained engineers. The devotion of the Zairean technicians involved also played a major role in ensuring success.

The experience gained has led to the production of several handbooks on the installation and maintenance of PV refrigerators. In addition, the Zairean company FNMA designed a solar refrigerator destined for use in the project. One of the most efficient in the world with regards to energy consumption, this refrigerator meets WHO's standards. Other international aid organisations have also bought FNMA refrigerators for vaccine storage. Today, the company has produced some 500 units, 200 of which have been exported.

The European Community financed a three-year regional maintenance programme for the 850 installed systems. Each regional maintenance base is composed of (at least) the technician who supervised installations in that region, an office and workshop, a four-wheel drive vehicle and a stock of spare parts for the PV systems. Each region's technician is responsible for quarterly preventive maintenance and the training of system users. Particular attention is paid to the training of the medical staff who use the systems, as they are also responsible for regular maintenance.

In all, the EC-funded programme and other smaller international programmes have now resulted in more than 2000 lighting systems and 300 vaccine solar refrigerators being installed in the health sector. In 1991, the World Bank agreed to finance a programme of communications with VHF transceivers powered by PV for rural health zones. The National Office of the Expanded Programme of Immunisation is now planning to install more PV refrigerators. IT Power has been involved in these projects, and also in the development of incubators for premature infants and solar-powered pumps for water supply in health centres.

Zairean technicians monitor the performance of PV modules



The head nurse of a maternity ward adjusts the position of a PV-powered lamp used during night deliveries at Kabeya Kamuanda Health Centre