

CRES - THE REGIONAL TOOL OF WEST AFRICAN NATIONS TO PROMOTE THE USE OF RENEWABLE ENERGY

Abdousolem Ba
Chef du Projet, CRES
Bamako/Mali
B P 1872

INTRODUCTION

Hit by a two-fold energy crisis - rising costs of importing oil and deforestation - the heads of the states of the CEAO (Communauté Economique de l'Afrique de l'Ouest) countries decided in 1978 to create the Centre Regional d'Energie Solaire (CRES). The member states of CILSS (Comite Permanent Inter-Etats de Lutte Contre la Sedreresse dans le Sahel) countries joined them later, and the following countries are now members of CRES: Burkina Fasso; Benin; Cape Verde Islands; Chad; Gambia; Ivory Coast; Mali; Mauritania; Niger; and Senegal.

From the point of view of all of the member countries, CRES must become the regional tool used by West Africa in order to become more proficient and self-sufficient in the techniques and exploitation of renewable energy sources.

EXISTING EXPERTISE IN RENEWABLE ENERGY IN THE REGION

The region already has major experience in the field of renewable energy: research centres exist or are currently being established; production units have been erected; and a substantial range of equipment utilising renewable energy has been installed, financed to a great extent by foreign aid. Despite these efforts, renewable energy does not yet play a significant role in the energy supply of the region.

However, renewable energy equipment is positively accepted by the population provided it is well adapted to their needs and reliable, and there is potential for a massive promotion of renewable energies in the region.

The region has important renewable resources including solar energy, biomass and wind energy, as well as sites for mini and micro hydro-energy plants. However, these resources are unequally distributed and require detailed exploration.

The proposed CRES project

The region cannot afford to be a mere spectator to technological progress especially in a field such as energy which is of such importance to these populations. The policy proposed encompasses not only energy conservation and the development of renewable energy sources, but also the installation of production, engineering and research facilities necessary for this development within the West African region.

Priority objectives

The most important priority is the development of renewable energy sources in rural settings. Renewable energy sources are particularly useful in a rural setting, because there are modular units, autonomy, simplicity, and long lifespan.

The most important energy demands renewable energy resources could satisfy include: a. cooking; b. water pumping; c. health care; d. lighting; e. preserving food; and f. small electrical distribution networks (for a village, group of houses, etc).

The second priority is the reduction of marketed energy sources. The most important uses of marketed energy sources are: housing (air conditioning, hot water); transportation; and industry.

The following efforts will be made on a short-term basis:

- energy conservation;
- hydroelectric power, which could play a much bigger part in industry and housing;
- utilisation of organic refuse in industry;
- solar water heaters, to be used more widely.

In the mid-term future, efforts should be placed on the development of solar air conditioning. In the long-term, the widespread utilisation of biomass for electrical power and transportation must be developed.

GOALS OF CRES PROGRAMME

With the policy and the priority objectives as defined above, we can now turn to the goals for the development of renewable energy. These goals will be illustrated with some short and longer term targets as a model of what could be done in the region.

Fight against deforestation

Furnish the vast majority of households with wood or charcoal improved stoves as rapidly as possible.

1990 goal: 50% of all urban and rural households so equipped
year 2000: all urban households equipped.

High-yielding charcoal production should become the rule, and there must be more development of sectors involved in the manufacturing of charcoal from agricultural and industrial refuse. At the same time, active participation in reforestation programmes will be encouraged.

Rural development

Water supply for villages and livestock, micro-irrigation

Areas of water supply must be equipped with photovoltaic pumps whenever supply and demand exceed 5m³/hr per well.

1990 goal: over 50% of all wells will be pumped by means of electrical power
year 2000: all wells pumped by means of electrical power.

Irrigation

1990 goal: discontinuance of at least 50% of all diesel or gasoline engines
year 2000: almost total withdrawal of diesel or gasoline engines.

Alternatives planned include: hydroelectricity; photovoltaic pumps; thermodynamic pumps; diesel engines operating on plant oil, biogas, or ethanol; and wind turbines.

Health

Rural health centres to have supply of:

- bacteria-free water
- hot water
- lighting
- radio hook-up with major centres
- medication and vaccine refrigerators.

1990 goal: 50% of all health centres
year 2000: 100% of all health centres.

Rural electrification

Each village will be equipped with a public lighting system, and households will be encouraged to install modern lighting units. The foreseeable energy source is the photovoltaic generator.

1990 goal: 50% of all villages equipped with public lighting
year 2000: all villages equipped with public lighting.

Reduce consumption of electricity and fuel-oil

Solar heat should be widely encouraged for use in housing and industry.

1990 goal: all new public buildings, and a large proportion of private buildings, must be equipped with solar water heaters
year 2000: solar heat must be used in most industries where low and medium temperatures are required.

Systematic use of agricultural and industrial refuse, as well as refuse from wood industries must be the rule, so that these industries can become self-sufficient in energy.

1990 goal: all relevant companies should be making use of their own industrial refuse as an energy source.
From 1990: a programme should be developed to produce new types of fuel for transportation (methanol, ethanol and plant oil).

Improving the quality of public services and reducing recurring costs

Photovoltaic generators will power all telecommunications and signalling equipment in isolated areas which use under 1 KW permanently.

1990 goal: all units should be operating on photovoltaic energy.
year 2000: extension of this application to equipment operating on more than 1 KW permanently.

THE FUNCTIONS OF CRES AS A REGIONAL CENTER

CRES has been assigned to carry out the following functions at the regional level:

- documentation and information
- personnel training
- research
- engineering and consultancy
- production
- marketing
- financing

The official statute of CRES will divide CRES into two different parts under the umbrella of one general director of CRES. These two parts are:

1. A public institution for the promotion of "technology".
2. A share-holding private company to promote and participate in the field of "production". (The shareholders of this company will be the different governments of the member countries).

PHASES FOR THE IMPLEMENTATION OF CRES

The implementation of the CRES project includes several phases. The first one, "PREFAS", is now nearing completion. The next phase, "PRODIAG", for the years 1985-1987, developed out of a recent evaluation and is now in the process of being adopted by the officials of CEAO and the Orientation Committee.

In "PREFAS", the following actions have been or are being realised by an intermediate institution called BER (Bureau d'Etude et de Realisation), created to realise the phase "PREFAS".

Preparation of the organisation of CRES

All necessary steps have been fulfilled. It is foreseen that on the 1st July 1985, CRES will be officially installed with all corresponding governing and advisory bodies.

Support to national partners in establishing "National Centres"

In all nine member countries, National Centres have been identified and the question of who will take over the leading function clarified. In some countries, BER has initiated the creation of a national centre. For the years 1983 and 1984, 315,000,000 CFA francs and 180,000,000 CFA francs respectively have been made available for providing the National Centres with scientific research material and for the training of the personnel. The delivery of scientific material is at the moment under way.

A comprehensive study to develop a strategy for the promotion of production units

These production units should in future produce several devices to use renewable energy or to produce constant energy from renewable resources. Also industrial processes based on using renewable energy can be included in the promotion

which CRES has to carry out in the future. The study, called UPS, is now being finalised.

Programme planning for member countries

BER has been charged to assist the member governments in developing national plans for the next five years in order to increase the use of renewable energy. The different national plans are to be harmonised by BER in such a way that different regional programmes can be presented to different donors. Several regional programmes have been developed, for example:

A programme of village water supply, primarily using photovoltaic pumps and if possible wind mills.

An education programme to provide light to rural classrooms and supply electricity for school television.

A rural health programme to reinforce existing infrastructure of rural health and improve quality and efficiency of services (lighting, sterilisation, cooling of vaccines and hot and cold water).

A telecommunications programme to promote local and regional communication in order to overcome isolation.

A transport programme to improve traffic signals and guarantee security and better operation of air traffic and railway transport.

A distribution programme for improved stoves in order to fight deforestation through more efficient utilisation of wood.

Information and documentation

A special school booklet has been developed and tested in schools. This booklet, called "Gains of the Sun", is designed to inform children up to the age of 10 years about the possibilities for the utilisation of renewable energy and explains why this kind of energy can be regarded as renewable. The booklet is now ready for large scale printing and distribution to nearly all of the region's schools.

Construction of the CRES buildings

Construction of the CRES head office is now in progress on a 30 ha site in Bamako and will be completed within the next 18 months. This compound will house the administration, educational classrooms, conference rooms, a documentation centre, laboratories and workshops, a computer centre, student hostel and dining and living quarters for CRES permanent staff.

Financing of the CRES headquarters, as well as the phase "PREFAS", was assured by the following donors: African Development Bank; OPEC; UNDP; CEAO; European Community; France; Federal Republic of Germany; and United States of America.

IMPORTANT CONDITIONS FOR CRES TO SUCCEED

There are two factors involved in the successful development of the project.

1. Sound management of all activities which must be efficient and financially accountable.
2. Backing of political authorities of all member countries.

CRES tries hard to fulfill and assure these two prerequisites. For example, BER has installed a modern computer-based accounting system, called OCAM. And we have recently received fullhearted support from the political authorities.

The heads of State of the CEAO, which convened at their last summit conference in Bamako at the end of October 1984, declared the following concerning CRES:

"We commit ourselves individually and collectively in the values of our Governments and Peoples, to uphold the coordinating and orienting role of the Regional Solar Energy Centre (CRES) in putting these programmes into practise.

"We recommend that the national government structures of the member states should reinforce, or create, in 1985, the industrial capacity indispensable for partial or total production of equipment using renewable energy sources, in conformity with the industrial strategy defined in the framework of the survey by the Production System Unit (UPS) of the Regional Solar Energy Centre (CRES).

"Consequently, we commit ourselves to give the Regional Solar Energy Centre all forms of support and assistance necessary for the accomplishment of its community and international undertakings.

"The Conference of CEAO Heads of State meeting during the 10th Summit of the West African Economic Community, encourages all activities undertaken to promote renewable energy and to economise conventional sources of energy."