68102

Distr.:

LIMITED

ECA/NRD/MES/6/90

Original: ENGLISH

ECONOMIC COMMISSION FOR AFRICA

Report of the mission 10-25 April 1990
to the
Department of New and Renewable Sources of Energy
Ministry of Energy and Petroleum
Angola

Mission purpose

The mission was mounted in response to the 31 October 1989 request of the Department of New and Renewable Sources of Energy (DNRFE) for ECA advisory service assistance in the drafting of Angola's policy and strategy in renewable energy resources development and utilization. The present mission was following -up on the work initiated by the advisory services mission of October 1989.

Background

The ECA advisory mission 10-31 October 1989, to the DNRFE had conducted an appraisal and made a discussion-presentation on the need for renewable energy policy and strategy in Angola (see NRD/MES/20/89). Based on the need appraisal a set of suggested element for renewable energy policy and strategy for the orderly transition to sustainable development in Angola were drafted at ECA. The texts of the need appraisal and the first draft of suggested elements were delivered to the DNRFE towards the end of March 1990 via the UNDP office in Luanda.

Discussion and revision of the first draft

The follow-up mission presented the contents of the need appraisal and the first draft of suggested elements of policy and strategy. Both were discussed in detail throughout the first half of the mission duration. The Department made numerous comments and suggestions and several specific amendments for the revision of the first draft. The text of the second draft encorporating the comments and amendments was presented to the DNRFE on 23 and 24 April in Luanda.

The DNRFE amendments

The following are the principal amendments made by the Department:

(i) The title to be specific to renewable energy policy and strategy for an orderly transition to a sustainable energy basis for development in Angola.

Addition of policy elements 3,4 and 5 prescribing:

(ii)supply of energy requirements of future development projects from cost-effective renewable energy resources available in or near to the project location (policy element 3).

(iii)on-the-job training of local manpower in the operation and preventive maintenance of technologies in projects of renewable energy development and utilization during project implementation(policy element 4).

(iv)establishment under the umbrella of the Ministry of Energy and Petroleum, of an autonomous institution that would implement renewable energy policy and strategy in Angola (policy element 5).

DNRFE preparation of the draft renewable energy policy and strategy

The DNRFE plans to have the second draft (Annex I) translated into Portugese to circulate soon for comment by concerned institutions in Angola including other departments of the Ministry of Energy and Petroleum, the Ministry of Agriculture and Rural Development provincial administration authorities etc. It will then prepare the draft renewable energy policy and strategy of Angola taking relevant comments into account.

The Department expects to submit to government within 1990, its proposed draft of national renewable energy policy and strategy.

Significance of the renewable energy policy and strategy of Angola

Angola ranks second to Nigeria in annual oil output among the six subSaharan oil producers. Over 90 percent of Angola's 1989 oil production

of 165 million barrels was exported. The country's overwhelmingly oil dependent economy is often referred to as a "petrolized" economy.

Oil extraction rates which have recently been growing rapidly in Angola mean that reserves of high quality crude oil are depleting fast. This will force it to turn soon to extraction from lower quality reserves at greater expense and higher rates in order to maintain export revenues at accustomed levels.

Building of sustainable energy systems based on decentralized renewable energy resources should be the corner-stone of strategic planning for the timely weaning of Angola's economy from over dependence on oil. Early adoption and effective implementation of coherent, country-specific, forwardlooking renewable energy policy and strategy in Angola would be of crucial importance also for mitigating the adverse impact of the inevitable fall in oil production and export revenues.

An orderly transition away from over-dependence on oil towards longterm sustainable renewable energy systems in Angola, guided by country-specific renewable energy policy and strategy would be an example of considerable significance to the 41 oil importing African countries and especially to the other member States of SADCC all of which are oil importers.

Recommendations

The DNRFE is persistently pursuing despite several substantial constraints, its aim of formulating renewable energy policy and strategy for Angola. The Department has turned to the ECA for suggestions of elements that would be the core-components of country-specific renewable energy policy and strategy. The set of elements suggested by ECA appear likely to occupy a very substantial place in the final draft proposal the DNRFE submits to government for approval.

The Department may request further ECA assistance in integrating relevant comments by other Angolan departments and institutions into its final proposal of policy and strategy. The Secretariat may wish to respond favourably to such a request not only because this will facilitate close monitoring of the final stages of the DNRFE initiative, but also because adoption of a renewable energy policy and strategy in Angola is as noted above of regional significance for ECA member States.

Distr.:
LIMITED
ECA/NRD/MES/6/90
Annex I
Original: English

UNITED NATIONS
ECONOMIC COMMISSION FOR AFRICA
Regional Advisory Service on Energy

SECOND DRAFT

Renewable energy policy and strategy elements suggested for the orderley transition to a sustainable energy basis for development in Angola

Background

The advisory service mission on energy 10-31 October 1989, to the Department of New and Renewable Sources of Energy (DNRFE) held extensive discussions on activities and prospect in new and renewable sources of energy (NRSE) in Angola. On the basis of discussions and visits to several DNRFE projects, a presentation was made on 31 October, 1989 to a meeting chaired by chief of DNRFE on the "Need for renewable energy policy and strategy in Angola" (Anned II).

The ECA subsequently prepared a first draft of "Renewable energy policy and strategy elements suggested for the orderly transition to sustainable developemnt in Angola", based on the presentation and discussion at the 31 October meeting.

A second advisory mission 10-25 April, 1990 presented the first draft to the Department where it was discussed and commented on in detail. The second draft of the suggested policy and strategy elements presented herein, encorporates comments and suggestions made by the DNRFE.

Energy endowments, supplies and access

Angola's endowments of both renewable energy resources (biomass, hydro, solar and wind) and non-renewable resources (petroleum and natural gas) are known to be ample. The 1986 national energy balance showed enviable surpluses of available supplies over consumption in woodfuel, hydroelectricity, petroleum and natural gas. However the low level of average annual per capita energy use (234 kgoe) means the majority of Angola's citizens in rural, urban and mining areas paradoxically had little if any access to electricity and petroleum products to utilize for easing exhausting hard labour in agriculture, rural industry, services and households and in travel and transport. Women in particular have the least access to inanimate energy for reducing the exhausting drudgery of household chores they must perform daily to meet the family's needs.

Rural energy access and national development

Rural poverty resulting from low outputs due mainly to lack of access to inanimate energy for utilization in improving their productivity and the services and amenities at their disposal, in the eyes of rural people dims their prospect of improvements of quality of life in the forseeable future. So, able-bodied Angolans have led the rural exodus in rapidly growing numbers to choke the urban and mining areas where the benefits of energy access that people with better incomes enjoy are all too visible. The drastic declines of agricultural output which are a consequence of this exodus, intensify national dependence on food imports not only for urban and mining areas, but also for an increasing number of rural localities as well.

The majority by far, of the rural migrants do not find expectations of new secure livelihoods, modern services and amenities fulfilled in urban and mining areas. Rather, they find they have joined the jobless, skill-less, helpless and homeless at the bottom of another poverty trap in overcrowded slums that are disease and crime infested. Migration into urban areas has in recent years been augmented by lack of safety and security in certain parts of the country. But this effect may disappear with the return of peace.

The development trend thus unfolding in both rural and urban areas is a vicious down-ward spiral, clearly unjustifiable and unsustainable economically, environmentally, politically and socially. The strategy commonly advocated to arrest and reverse within acceptable time-frame at affordable costs, this mal-development trend is to increase widely rural distribution of fossil fuel and hydro-electric and supplies from large energy sources, for equitable energy access in rural, urban and mining areas. The experience of developing countries comparable to Angola that have attempted to apply this strategy does not confirm success.

On the other hand most of rural Angola is adequately endowed with one or more types of renewable energy resources, such as are now being cost-effectively harnessed and efficiently utilized on small scale, equally well in rural or urban areas in developing and developed countries in other continents. Local small renewable energy resource utilization is proving particularly suited for rapid enhancement of rural quality of life in some developing countries applying this strategy. Seen in this perspective, cost-effective development and efficient utilization of local renewable energy

resource is not marginal, but rather of decisive importance for energizing rural development by substantially improving the rural energy basis indispensable for sustainable development in Angola.

Non-renewable energy use and climate change

Rapid build-up in the earth's atmosphere, of greenhouse gases consisting mainly of CO2 and other gases of combustion of fossil fuels around the world, is inducing global warming. Recent adverse climate changes diagnosed as impacts of global warming are now leading to world wide concern that fossil-fuel dependent socio-economic systems are environmentally and hence economically, politically and socially unsustainable in the medium term and beyond.

For this reason many nations are, devoting recently increasing efforts to re-oreinting their socio-economic systems toward long term sustainability. Rapid transition to long-run sustainable energy systems, mainly based on cost-effective decentralized development and efficient utilization of local renewable energy resources, is gaining growing advocacy as the foundation essential for sustainable socio-economic systems. A declining ratio of fossil fuel may however be expected to persist in the energy-mix of many nations into the forsee-able future.

For the reasons briefly touched upon above, it is clearly desirable in the best national interest, to formulate, adopt and implement in Angola, country-specific policy and strategy for the accelerated and extensive cost-effective development and efficient use of renewable energy resources through out all sectors of the economy and society. The DNRFE may therefore wish to include in its draft of national renewable energy policy and strategy some of the elements suggested hereunder.

Policy elements suggested

1. Include as an integral part and major priority of national development plans and programmes, the cost-effective development and efficient utilization of indigenous renewable energy resources for energy required in all sectors.

2. Make a major priority of energy sector plans and programmes, the rapid achievement at local, municipal, provincial and national levels of rural energy

self-reliance and self sufficiency based on local renewable energy resources efficiently utilized for production, services, amenities and households.

3. Include as an integral part and major priority of development projects in provincial, municipal and community areas, the supply of project energy requirements from cost-effective renewable energy resources available in or nearest to the location of each project.

4. Give highest priority in all local rural renewable energy resource development and efficient utilization projects, to on-the-job-training during project implementation, of suitable local manpower in the proper operation and preventive maintenance of renewable energy technologies applied in each project.

5. Establish under the umbrella of the Angolan Ministry of Energy and Petroleum, an autonomous institution that effectively and vigorously implements national renewable energy policy and strategy.

Strategy elements suggested

The implementation of renewable energy policy in Angola would be facilitated by strategy that includes the following elements:

1. Set quantitative target schedules for phased growth of the ratio contributed to the energy-mix by renewable energy supply and efficient utilization to be attained in specific rural, urban and mining areas at specified times.

2. Mobilize and allocate the financial, human and material resources required for effective pursuit of the targets adopted.

3. Build systematically and rapidly the full profile of national skills at all levels essential for development of the country's renewable energy resource endowments including biomass, hydro, solar and wind energy and their efficient use. The profile of skills includes competence to make effective and high local contributions in each renewable energy resource to:

a. resource exploration, identification and assessment.

b. designing, building and installing of resources-conversion equipment and processes to the form(s) of energy supply optimally matched to efficient utilization for principal needs in specific localities.

c. effective operation, maintenance and repair of all the energy supply and utilization system components.

4. Build systematically and rapidly, national-skills to effectively:

a. survey internationally the markets for each imported component of renewable energy technology (RET) systems including energy production, transport, distribution and utilization.

b. properly select the technologies and/or technology components to be imported.

c. adapt imported RET to improve local suitability.

Building the skills enumerated in 3 and 4 above would be facilitated initially by training of properly selected Angolans. Such should be part and parcel of demonstration projects of renewable energy development and utilization like the ones already envisaged by the DNRFE in its photovoltaic, wind pumping and biomass projects.

5. Closely monitor research, development and demonstration of new products and processes and newly marketed products in RETs through appropriate research abstract publications (such as ASSET, INSPEC, Chemical Abstracts etc.) patent office publications, professional journals, company publications, trade journals, RET development information services and similar.

6. Commission applied research and development projects essential to adapt specific RETs to site specific conditions and endowments in Angola. If conducted by expatriate experts such R&D must be done as much as possible in Angola with effective collaboration of qualified national staff, of relevant organizations.

7. Promote and facilitate collaboration between Angolan and foreign entities in the research, development, demonstration, adaptation, licensing, or joint-venture production and marketing of cost-effective renewable energy

development as well as in supply and efficient utilization technologies.

8. Ensure that arrangements entered for the production of any RET in Angola include effective and rapid transfer of technology on equitable terms as well as rapid increase of indigenous material and skill content to the output product.

Either of the Angolan or foreign partners for such collaborative arrangement entered into in 7and 8 above, may be governmental, public or private sector, non-governmental, academic, research or other organization or legal entity.

9. In the assessment of the economic feasibility of alternative non-conventional renewable energy resources development and efficient utilization, take account of the costs to the nation of all direct or indirect subsidies or taxation provisions favouring conventional energy supply and utilization competing for implementation, so that true economic costs and benefits are known.

10. In collaboration with relevant authorities and entities, design, promote and implement or facilitate the implementation of multi-use tree planting projects to supply woodfuel and charcoal and in addition some of the other common needs for trees such as food, fodder, chemicals, dye stuffs, medicines, spices, poles, timber for construction, furniture, tools, utensils, etc.

11. Build into each stage of renewable energy resource development and utilization projects, opportunities for highly cost-effective contributions at local, municipal, provincial and regional level, from concerned officials and users.

12. For rural energy self-sufficiency projects in particular, ensure appropriate local user participation. This is indispensable in the design of characteristics of the supply project, as well as in project implementation, operation, maintenance, repair, management and ownership.

13. Promote and facilitate the setting up and effective functioning of rural renewable energy autonomous cooperative and/or private enterprises in

rural communities to pursue targets set towards energy self sufficiency from local resources.

14. Compare development of renewable energy supply and/or efficient utilization proposals competing for priority ranking on the basis of annual energy output or saving, the internal rate of return, the capital investment amount and the sum of annual operating costs and subsidies.