



# United Nations Environment Programme



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UNDP/UNEP Meeting of Government Experts  
for Developing a Co-operative Programme on  
the Practical Applications of Renewable  
Sources of Energy in the Mediterranean Region

Malta, 9 - 13 October 1978

PROPOSALS AND INFORMATION RECEIVED FROM  
INTERNATIONAL ORGANIZATIONS \*

\* Reproduced in the chronological order in  
which they were submitted.



World Meteorological Organization (WMO):

Activities in the field of renewable sources of energy.

The World Meteorological Organization has a WMO Plan of Action in the Field of Energy Problems composed of three elements:

- Energy production (including assessment of water resources for hydropower);  
Energy transport, exploration, conservation and consumption;
- Utilization of wind and solar energy and other new energy sources.

Within the third element the following items are included:

Solar Energy

In view of the high priority accorded to this subject area, an Organizing Committee was established for a proposed meeting between solar radiation specialists and solar energy technologists and the same Committee was requested to develop an outline for a Technical Note on meteorological aspects of the utilization of solar radiation as an energy source. This Technical Note will be primarily designed for use in international meteorological services in order to assist them in satisfying the requirements of the technologist. The Organizing Committee met in 1977 and drew up a specific programme for the solar radiation meeting which is expected to take place during October 1978. Furthermore, an outline for the Technical Note was worked out and arrangements made for drafting the different chapters.

The Technical Note will need to be finalized for publication in 1979 after the solar radiation meeting has taken place and additional input obtained. In the selection of participants for the meeting, the Organizing Committee proposed names of individuals who were known to be meteorological and engineer specialists in the field to be discussed and also took into account the desirability to have equitable geographical representation. Regarding the technical and scientific aspects of the meeting, the Organizing Committee was of the opinion that the emphasis will have to be placed on rendering assistance to those using solar radiation. To this end the Committee drew up a list of factors relevant to solar radiation, e.g. global (on horizontal and inclined surface), direct, diffuse, terrestrial and sky radiation, as well as data on wind, temperature, cloudiness, humidity, turbidity, etc. with an indication of corresponding needs of users related to the areas of heating and cooling, power generators, photosynthesis, photochemistry and biology.

### Wind Energy

Preparation for a meeting in late 1979 will be very similar to that for the meeting discussed in the preceding paragraph in that there will be need for an Organizing Committee to consider a programme for the meeting and to develop the outline of a Technical Note on Meteorological Aspects of the Utilization of Wind as an Energy Source. A first draft of such an outline is contained in the report of the Rapporteur on Applications of Meteorology to the Development of Atmospheric Energy Resources. It is expected that the substance of the report will constitute a framework within which to develop the Technical Note.

### Special Environmental Report

The preparation of a Special Environmental Report to draw the attention of both meteorologists and users to various ways in which meteorology could be used in solving problems in the energy area is planned for 1980.

### Training and Technical Advice

As part of its normal functions WMO is able to support training activities and the provision of technical advice to Members within the limit of available funds.

### United Nations Educational, Scientific and Cultural Organization (UNESCO):

#### Resume of Solar Energy Activities.

1. UNESCO is involved in Solar Energy Application activities in many countries by means of organizing training of local personnel through special solar energy courses, practical workshop on solar energy utilization, seminars and conferences, and by providing direct financial support to institutions and universities involved in solar energy research and development.

2. Two solar energy courses have been sponsored by UNESCO, one in Perpignan (France) - conducted in French - since 1973 and the other in Niamey (Niger) - conducted in both French and English - to be carried out during 1978. Negotiations are starting to organize solar energy course of MSc level in England.

3. An International Seminar on solar energy building technology held at the North East London Polytechnic (England), as well as several practical workshops on solar energy applications in developing countries, were organized by UNESCO in 1977-1978. UNESCO provided financial support to the International Solar Energy Congress organized by ISES in New Delhi in January 1978 and to the Second Latin American Solar Energy Congress held in Paraiba (Brazil) in February 1978.

4. Under UNESCO Participation Programme, permanent practical assistance is delivered - upon request - to developing countries. This assistance consists in sending short-term consultants and expert missions, in contributing financially to purchase equipment and in paying for fellowships to develop national solar energy programmes and to strengthen existing solar energy research. Two large-scale solar energy projects were prepared by UNESCO for Mexico (one in photovoltaic conversion, the other on solar water pumps), to be started in 1978.

5. UNESCO undertook a special solar energy mission to Latin America in 1976. As a follow-up of that mission UNESCO's Regional Office for Science (Montevideo) started promoting co-operation among Latin American countries in the field of solar energy.

6. In January 1978, UNESCO organized in New Delhi an Asian Working Group on Solar Energy with the aim to discuss national programmes and activities and identify the main directions of future development on the regional and sub-regional levels and to make recommendations for a co-operation programme in the field of solar energy.

7. In May 1978, UNESCO organized in Varna, Bulgaria, the Second European Solar Energy Meeting on co-operation in the field of Solar Energy Applications. The meeting discussed and adopted recommendations on solar energy scientific education, exchange of experts, exchange of information, creation of information centres and an Advisory Board to UNESCO having an Executing Committee.

United Nations Economic Commission for Africa (ECA):

Relevant activities in the field of non-conventional sources of energy.

ECA activities in the field of non-conventional sources of energy practically started in 1977 and its Work Programme is mainly based on a comprehensive five-years project on solar energy development in Africa.

The objectives of the project are:

- a. The strengthening of existing research and development centres in solar energy and the provision of assistance in the launching of new experimental centres for research and applications;
- b. The training of about 30 research workers, engineers and technicians in various solar techniques;
- c. The mounting of a campaign to measure direct and diffuse solar energy at about 20 carefully selected spots on the continent of Africa using mobile independent stations which will make it possible to define regional solar energy coefficients;

- d. The mounting of a large-scale campaign to demonstrate solar infrastructure and equipment with a view to making African governmental authorities and public opinion aware of the numerous possibilities offered by solar and wind energies;
- e. The convening of a seminar each year throughout the duration of the project for about 20 Africans and non-Africans who have gained recognition for their efforts to develop the use of solar energy in Africa (scientists, engineers, administrators and manufacturers of equipment).

In the light of the above-mentioned objectives, advisory services on the development and utilization of solar, wind and biogas energies in Africa were given, on request, to eleven countries; a solar energy library within the Energy Resources Unit was established, country files were prepared and technical and commercial data on solar energy were assembled; a seminar on solar energy in Africa is under preparation with a main view to establish an African Solar Organization; organisation of solar equipment demonstration in Africa is planned; a list of training institutions in solar energy was prepared and distributed to member States; an initial number of five fellowships for training in solar energy outside Africa was secured for the 1978-1979 school year and it is hoped to increase the number of fellowships for the same year during the next few months.

#### The Arab Educational, Cultural and Scientific Organization (ALECSO):

##### Summary of activities in the field of renewable energy sources in the Arab States.

1. The Arab States recognized the necessity to explore and exploit the infinite resources of solar energy and other renewable energy sources. This increasing interest is justified by the fact that all the Arab States lie within the solar belt and enjoy between 3600-4000 solar hours per year with a density reaching one Kw per square meter per hour. It was clear that a regional programme of co-operation in the field of solar energy and other renewable sources is indispensable. This determination among Arab responsible leaders was fully expressed in the resolutions of the ministerial conferences and other regional meetings, such as:

- The first conference of the Arab Ministers responsible for the application of science and technology to development (Baghdad, April 1974).
- The General Conference of the Arab League Educational, Cultural and Scientific Organization (Cairo, December 1975).
- The Second Conference of Arab Ministers responsible for the application of science and technology to development (CASTARAB, jointly organized by UNESCO and ALECSO, Rabat, August 1976).
- Several Arab expert meetings.

2. ALECSO, the specialized agency of the Arab States in the fields of education, culture and science, was charged with the task of exploring the possibilities of Arab co-operation in solar energy research and application, particularly the establishment of a regional Arab Center for solar energy.

In the past two years ALECSO carried out a field survey of the present state of research and activities, needs and priorities in the Arab member States with regard to solar energy. This survey was realized through:

- Designating two teams of solar energy experts (from Jordan, Iraq, Egypt and Sudan), one team visited the Arab States in North Africa, the other team was received by the Arab States in West Asia.
- A questionnaire seeking information on the following:
  - The present state of research facilities in solar energy;
  - The present plans of S.E. research and applications;
  - The future plans of S.E. research and applications.
  - Finance and technical cooperation with foreign establishments in S.E.
  - Local needs and national priorities concerning S.E.
  - Personnel engaged in S.E. activities.
  - Views on the establishment of a S.E. regional center in one of the Arab States.

This preliminary survey was carried out in 9 Arab States.

### 3. 1978-1979 programme:

- ALECSO will carry out an exhaustive survey of the present state of activities and potential uses of renewable sources of energy in all Arab States to complete and update the previous survey, taking into consideration the different renewable sources of energy. ALECSO will co-operate with UNEP in this regard.
- ALECSO will prepare working papers based on actual factual findings to be presented in a meeting which the Organization will hold in 1979, with the purpose of developing a co-operative programme leading to the practical applications of renewable energy sources. UNESCO is expected to participate.
- ALECSO will organize a number of training courses in solar energy fundamentals and applications for Arab technicians engaged in solar energy to be held in one of the solar energy units in the Arab Region in co-operation with UNIDO.

United Nations Economic Commission for Europe (ECE):

Summary of major activities relevant to the meeting.

The Economic Commission for Europe (ECE) has long been involved in numerous projects of energy policy as well as in several areas related to energy technologies. The projects will not be indicated here but only those activities which are underway, as listed in the 1978-1982 programme of work of ECE, and which are of direct relevance to the topic of the meeting of government experts.

In the field of energy policy in general:

- several projects on medium and long term energy trends and perspectives aimed at expanding inter-governmental co-operation on general energy problems;
- several activities related to the problem of energy economy and efficiency and on the results of energy conservation policies in various sectors (housing, building, industries, transportation, agriculture, forestry, etc.);
- a group of projects dealing with the use of models for policy making in the energy sector.

In the field of various energy technologies:

- rural electrification and electric power supplies for islands and isolated areas;
- utilization of geothermal energy;
- impact of long-term energy problems on human settlements policies;
- water problems in islands and coastal areas with special regard to desalination and groundwater;
- technological forecasting, trends and prospects and their effects on major economic sectors (including energy);
- technological assessment, particularly in the field of new energy technologies;
- promotion of the transfer of technologies including the preparation of a manual on licensing procedures;
- utilization of forest products in the energy sector;
- means of reducing energy consumption in the heating of greenhouses.



Furthermore, two Seminars are planned in the specific field of renewable sources of energy. The first of these will be taking place in Spain during the second quarter of 1979 and will have as its theme "Co-operative technological forecasting on technologies relating to solar energy as derived from direct solar radiation". The second, which will be taking place in the Federal Republic of Germany in the latter part of 1979, will be considering new energy sources and, in particular, solar, wind and geothermal energy.

United Nations Food and Agricultural Organization (FAO):

Activities in the field of energy in the Mediterranean Region.

One of the major problems of the Mediterranean region with reference to energy is the issue of fuelwood. The major activities of Forest Resources Division in relation to renewable sources of energy focus on the improvement of fuelwood supplies in many developing countries in the Mediterranean region which are dependent on wood for this purpose. These activities, which are normally carried out in co-operation with the relevant member countries, were pursued under the principle of the rational management and efficient utilization of the existing wood resources and the expansion of these resources through afforestation where fuelwood is grown either as a principal product or as a by-product of other crops. This work has been conducted by FAO for the past three decades and is at present the subject of an accrued emphasis through the programme on forestry for local community development. In the field of afforestation, attention has been given to techniques of plantation and establishment. Studies were made on Tree Planting in Arid Zones (1955 and 1960), Eucalypts for Planting (1952 and 1978), Tools and Equipment for Planting and Reforestation (1957), and Establishment Techniques in Forest Plantations (1978).

Other publications such as Tree Seed Notes; Forest Seed Directory; World list of tree breeders; Forest Gene Resources Information; Production, Trade and Consumption of Forest Products are published for use in different parts of the world, including the Mediterranean region. In addition to these studies, other special study and research projects, including a project on provenance trials is under way in many Mediterranean countries. A Consultation on fast growing species for the Mediterranean region is to be held in Portugal in 1978.

The programme on forestry for local community development will provide assistance to national governments establishing woodlot plantations to improve the fuelwood supply for the rural communities.

Over and above these activities, the FAO Forestry Department has been, or is still, co-operating with many developing countries in the Mediterranean region in the implementation of forestry projects in which fuelwood is a major component, namely:

- Forest tree species for arid zones (Regional Near East)
- Assistance to Forestry Development and Reforestation (Greece)
- Management and improvement of forest range land (Morocco)  
Forestry development and erosion control (Tunisia)  
Forest industries in the North Aegean - Marmara and Black Sea  
Regions (Turkey)

On the other side, the Forest Industries Division contributes to the field of renewable resources in the following manner:

- a) Provision of technical advice and information on all aspects of charcoal production from harvesting of the wood, raw material transport, drying, carbonisation, processing and transport of finished charcoal, briquetting of fines and recovery of by-products from carbonisation.
- b) Advice on the most efficient use of wood fuel for energy purposes varying from advice on domestic low cost stoves to industrial systems burning wood or wood residues for heat and power generation. Assistance in determination of a correct wood fuel policy for countries i.e. the correct balance between charcoal and wood fuel.
- c) Recovery of thermal energy in the pulp and paper industry i.e. black liquor recovery systems is dealt with fully in the normal operations of the Pulp and Paper Branch.
- d) Optimum use of wood residues arising from mechanical wood processing industries for heat and power generation is subject to special study as part of the FAO Portfolio of Small Scale Forest Industries.

All of the above activities, though not specially oriented on the Mediterranean area, are applicable to the special problems of this region. Further inputs on this subject are made on an ad hoc basis in the form of technical backstopping to UNDP Forestry Projects in the Mediterranean region.

Further the Land and Water Development Division has for the last three years paid special attention to the application of recycling of organic materials, a component of which is biogas production, in seventeen countries of the Asian Region.

The recycling of organic materials in agriculture covers the use of residues, animal wastes, night soil, city and industrial wastes for component making such as a source of organic fertilizer and biogas production. An Asian Region has been selected to initiate this activity since it has a long tradition of organic recycling with a range of capacities from the individual farmer's field level to the city municipality level.

Similar activity along the above line has been initiated in seven countries south of the Mediterranean coastline of the African Region in December 1977 and it is planned to convene in October 1978, in Egypt, an FAO/SIDA Regional Workshop on Organic Recycling.

The following are also other related activities which can be mentioned:

- 1) FAO involvement in the establishment of a pilot factory in Tunisia on separation and extraction of olive press cake using the separated pits as energy source.
- 2) FAO, through a UNDP project in Mongolia, may be involved in developing water, wind and solar energy for use in the trans-humance systems of animal production.

In addition to the above activities FAO has prepared a number of publications dealing with energy sources. The most important ones are as follows:

- a) "Energy and Agriculture". The State of Food and Agriculture (SOFA) Report 1976.
- b) "Energy for Agriculture in the Developing Countries" (Monthly Bulletin of Agricultural Economics and Statistics, Vol. 25, No. 2, February 1976).
- c) Publication of a Bibliography, a World-wide Directory of Institutions and a Compendium of Technologies concerned with residues of agriculture, forestry, fisheries and related industries joint FAO/UNEP publication 1978.
- d) Aquatic Sciences and Fisheries Abstracts (ASFA).

As far as ASFA publication is concerned, its scope has been expanded since January 1978 to cover world literature in the field of non-living resources. One of the subject categories of the expanding scope of ASFA, "Energy from the Sea", is designed to cover specifically scientific and technical papers on renewable energy sources: waves, tides, currents, thermal and salinity gradients.

Since January 1978, ASFA is available on tape for on-line inquiring and it is published in two parts: part 2 "Ocean Technology, Policy and Non-living Resources" contains the information relevant to renewable energy resources from marine environment. The monthly printed issues of ASFA - 2 include co-ordinated indexes by subject, taxonomic and geographic entries. The Mediterranean region is indexed under the marine area code MED, followed, when relevant, by the coastal country name.

ASFA is one of the products of the international information system on aquatic sciences and fisheries - ASFIS - co-sponsored by FAO, IOC and the UN Department of Economic and Social Affairs.

Finally, FAO is also engaged in the preparation of the following publications to be issued by the end of 1978:

- a) Energy for World-wide Agriculture
- b) Rice Husk as an Energy Source.

The World Bank:

Activities in the field of solar energy

1. As part of its general efforts to assist developing countries in preparing energy policies to meet their future needs, especially in the rural energy sectors, the World Bank has carefully monitored progress in technologies relating to so-called "non-conventional" energy sources, among which is solar energy.

2. The Bank intervenes in such fields as solar energy development only if it becomes apparent that developments which might be of value to developing countries are being overlooked or ignored, or if financing for their development and adaptation to the need of developing countries is not forthcoming from other sources.

3. Widespread utilization of solar energy will depend on the development of improved technology and materials, and even more on a reduction in price of solar devices. This latter is critically important for the use of solar energy in developing countries. The present state of solar technology gives reason to think that the necessary advances in technology may be forthcoming in the not-too-distant future, and it is now appropriate for the Bank to fund a modest field programme to demonstrate the feasibility of using solar energy in developing countries and to enable the inhabitants of those countries to gain operational experience in their use.

I. World Bank Projects Involving Solar Energy

4. (i) Over 60 % of Bolivia's 5.6 million people live in the difficult rural conditions of the Altiplano, (high semi-arid plains over 12,000 feet above sea-level) where, despite average daily temperatures below 50° Fahrenheit, there is a very low rate of energy consumption and the majority of the people depend on non-commercial energy sources. Fuels used in the home are those locally available, usually consisting of dried animal dung, grass knots, scrub twigs and roots. Currently, animal dung is the single most important source of fuel for household consumption in these areas, but non-commercial energy resources in the rural areas are inadequate to meet household requirements, being sufficient only for limited cooking, but not heating during the harsh winter months. Also, the use of dried animal dung as fuel eliminates its use as fertilizer. Alternative sources of energy for use on the Bolivian Altiplano are thus of critical importance. The Altiplano receives high levels of solar energy,

## II. Studies Concerning the Global Applicability of Solar Energy in Developing Countries.

8. (i) Study entitled "Energy and Development" by Dr. Jyoti Parikh of the International Institute for Applied Systems Analysis, Laxenburg, Austria. This is a study of overall energy needs in the developing countries with special emphasis on the needs of rural areas. While dealing with overall energy requirements, it contains a fairly extensive section on solar energy utilization and potential.

9. (ii) "Solar Energy Subsystems"; Summary of International Programme of Solar Energy Research and Development. Dr. Anwer Malik, Director of the Solar Energy Programme of the Kuwait Institute of Scientific Research, acting as consultant to the Bank, summarized the status of the solar energy research programmes in some 80 countries around the world. The report gives an account of the existing state of currently available solar technology.

10. (iii) Two studies by Bank Staff

- "Developing Country Applications of Photovoltaic Cells". 1/

"Solar Photovoltaic Cells in Developing Countries. 2/

describe the potential applicability of photovoltaic technology to rural education, health, forestry and other applications in developing countries. These papers were originally presented to international symposia of solar energy manufacturers and researchers, and were intended to bring to the attention of these experts the importance of the developing country market to the commercial future of photovoltaic technology. A third study of Bank staff "Critical Factors in Economic Evaluation of Small Decentralized Energy Projects" 3/, points out a number of pitfalls that face a researcher who seeks to justify the application of a small scale energy technology to a particular development need. It points out, for example, the necessity for careful pricing of inputs and outputs and realistic estimates of the physical quantity of useful output.

## III. Studies of the Applicability of Solar Energy to Situations in Particular Countries.

11. (i) Khumbu Valley Tourism Study (Nepal)

With funds provided under an IDA Credit for the first tourism project in Nepal (291-NEP), a study was carried out by the Nepalese consultants on the development of trekking tourism in the Khumbu Valley,

1/ Weiss, C., and Pak, S., "Developing Country Applications of Photovoltaic Cells", World Bank S&T Report No. 7, Jan.19.

2/ Weiss, C., "Solar Photovoltaic Cells in Developing Countries", World Bank S&T Report No. 26, Nov.1.

3/ Pak, S and Taylor, C.R., "Critical Factors in Economic Evaluation of Small Decentralized Energy Projects", World Bank S&T Report No. 25, Nov.1976.

which leads to Mount Everest. The Khumbu development plan proposed solar energy as a substitute for firewood, the demand for which is leading to progressive deforestation of the steep slopes of the Himalayan region and the irreversible loss of the thin top soil in these areas. Trekking tourists represent a major source of income and employment for the inhabitants, and a source of foreign exchange earnings for Nepal. The tourists add substantially to the use of firewood, which is already excessive, and ecological damage will continue unless alternative energy sources are developed for cooking and heating. The development plan proposed the use of solar energy to produce heat and hot water for the tourist trekking lodges and camp sites.

12. (ii) "Potential Use of Solar Water Heaters in India" by Dr. P. K. Rohatgi, Director, Council of Scientific and Industrial Research Complex, Cochin, Kerala, India.

13. This was a study of the possibility for local manufacture and use of solar water heaters in India for domestic and industrial purposes. The survey involved some field investigations and an analysis of production costs and material requirements under Indian conditions, and of the potential market for solar water heaters in India.

14. (iii) Rural Energy Study in Colombia. In cooperation with Colombian organizations the Bank is assisting a Rural Energy Study in Colombia which includes, among other objectives, the development and use of solar energy devices in rural areas. The main objective of the programme however, is to set up the appropriate national institutions to plan and implement rural energy projects in a comprehensive manner. A first 180 page report dealing with one rural region (Antioquia) presents an in-depth analysis of the situation and proposes recommendations for tackling with it.

#### Note on Biomass

The above list does not include Bank activities to increase the production of biomass fuels (principally firewood) which some would also include under the general umbrella of "solar energy". <sup>1/</sup> The Bank has or is financing 16 fuelwood components of Rural Development Projects and is planning to finance 15 others in the next few years..

#### United Nations Economic Commission for Western Asia:(ECWA):

##### Activities in the field of Renewable Sources of Energy.

Between now and 1983, ECWA is planning to implement a number of projects in the field of renewable sources of energy.

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<sup>1/</sup> In effect, there is no precise definition of solar energy. Broadly taking, it could include hydroelectricity and even fossil fuels. The energy of the sun, of course, is derived from nuclear sources.

The first of these projects, which will in fact be ECWA's first attempt in this domain, is entitled "Non-conventional sources of energy in the ECWA region: Research and development activities, ongoing programmes and future possibilities". Action will consist of an in-depth study and evaluation of the possibilities and the feasibility of introducing non-conventional sources of energy (solar, wind and biological) and other non-hydrocarbon energy forms in ECWA countries, together with policy implications. A report on the subject will be published in October 1979. In December 1979, a seminar/exhibition on research and development in non-hydrocarbon energy sources, with particular reference to the ECWA region, will be held, where the above report will be presented and discussed by country officials and a number of renowned experts, the latest technological developments and experiences in this field will be shown and explained, and advisory services on new energy sources will be sought for future follow-up.

It should be noted, however, that, in order to avoid duplication and ensure complementarity of efforts with other organizations in the region, the implementation of the above project will be reconsidered in March 1979 in the light of the work and findings of the First Arab Energy Conference, organized jointly by the Organization of Arab Petroleum Exporting Countries (OAPEC) and the Arab Fund for Economic and Social Development in Abu Dhabi between 4 and 8 March 1979, and to which ECWA's participation will be substantial.

On the other hand, ECWA's 1980-1983 draft medium-term plan includes the following projects in this field.

- Renewable energy for rural development: An assessment of low and non-waste technologies and the feasibility of their transfer to the ECWA region.
- Renewable energy for rural development: A case study.
- Solar/Nuclear: The situation and outlook in the ECWA region in the context of world economic, technological and environmental trends.
- Solar energy potential for desert development in the ECWA region.

United Nations Centre for Natural Resources, Energy and Transport (CNRET):

Summary of Activities in the field of New and Renewable Sources of Energy.

The CNRET and its forerunners have since the mid-fifties been active in promoting and encouraging the development and utilization of new and renewable sources of energy such as solar, wind, geothermal and biogas

by means of studies, reports\*, conferences and operational activities.

The Centre assisted in the preparations for and servicing of the Conference on New Sources of Energy which was held in Rome in 1961 and which provided a stimulus for our subsequent activities in developing new and renewable sources of energy including solar, tidal, and especially geothermal, in which area we have implemented a substantial number of UNDP-financed operational projects.

In recent years there has been a significant increase in interest in the potential of new and renewable sources of energy, resulting in a growing number of requests for technical assistance, to which CNRET has responded.

In addition, the Centre has convened a number of major international meetings such as the United Nations Symposium on the Development and the Utilization of Geothermal Resources held in Pisa, Italy, in October 1970, and the Second United Nations Symposium on the Development and Use of Geothermal Resources, held in San Francisco, California, USA, in May 1975, which was attended by 1,300 participants. Our current activities include preparations (jointly with the Japanese Government) for an Interregional Seminar on Solar Energy to be held in Tokyo in February 1979 and preparations for a major International Conference on New and Renewable Sources of Energy which may be convened in 1981. A report prepared by CNRET for the Secretary-General's submission to the last session of ECOSOC on the feasibility of convening such a conference was endorsed and referred to the 33rd session of the General Assembly for appropriate action.

Since 1977, the Centre, in co-operation with UNEP, has been responsible for the establishment of Rural Energy Centres for the purposes of the demonstration, in selected villages in Sri Lanka, Senegal and Mexico, of the feasibility of meeting part or whole of the village energy requirements from indigenous renewable sources such as solar, wind or biogas or a combination thereof. Requests for assistance in establishing similar REC's in other developing countries are under review.

At this time, the CNRET, in co-operation with UNIDO and FAO, is responding to a request for assistance from the Government of Mongolia for the exploitation of solar, wind, water power, and biogas, as a means of providing power supply to rural communities.

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\* e.g. New Sources of Energy and Economic Development: Solar Energy, Tidal Energy, Wind Energy, Geothermal Energy, Thermal Energy of the Sea (E/C 2997, 1957); New Sources of Energy and Energy Development: Report on the United Nations Conference on New Resources of Energy (E/3577/Rev.1 - ST/ECA/72, 1962); Progress Report on New Sources of Energy (E/4303, 1967); and Proceedings of the Second United Nations Symposium on the Development and Use of Geothermal Resources (3 volumes) - United States Printing Office, Washington, D.C., 1976.