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Intergovernmental Review Meeting of  
Mediterranean Coastal States and  
First Meeting of the Contracting Parties  
to the Convention for the Protection of  
the Mediterranean Sea against Pollution  
and its related protocols

Cannes, 5 - 10 February 1979

REPORT OF THE 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





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REPORT OF THE UNDP/UNEP MEETING OF GOVERNMENT EXPERTS  
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ON THE PRACTICAL APPLICATIONS OF RENEWABLE SOURCES OF ENERGY  
IN THE MEDITERRANEAN REGION  
MALTA, 9 - 13 OCTOBER 1978

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## Introduction

1. In the framework of the Action Plan for the Protection and Development of the Mediterranean adopted at the Intergovernmental Meeting on the Protection of the Mediterranean (Barcelona, 28 January - 4 February 1975) and as discussed at and supported by the Intergovernmental Meeting of Mediterranean Coastal States on the Blue Plan (Split, Yugoslavia, 31 January - 4 February 1977), and at the request of the Intergovernmental Review Meeting of Mediterranean Coastal States on the Mediterranean Action Plan (Monaco, 9 - 14 January 1978) <sup>1/</sup>, a Meeting of Government Experts for Developing a Co-operative Programme on the Practical Applications of Renewable Sources of Energy in the Mediterranean Region was convened jointly by the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). The Meeting took place in Malta, 9 - 13 October 1978, at the kind invitation of the Government of the Republic of Malta.

## Attendance

2. The meeting was attended by experts from fifteen Mediterranean Coastal States and the European Economic Community and by representatives of nine United Nations bodies, specialized agencies and other organizations. A complete list of participants is attached as Annex I to this Report.

## Agenda Item 1 : Opening of the Meeting

3. An opening address was delivered by the Hon. Wistin Abela, Minister of Development, Energy, Port and Telecommunications, on behalf of the Republic of Malta. Mr. Abela highlighted the role played by his country in the development of the Mediterranean Action Plan, and the special initiatives it had taken in calling for regional co-operation efforts in the field of renewable sources of energy. He laid emphasis on the Malta proposal for the establishment of a Mediterranean Regional Centre for the practical utilization of renewable sources of energy.

4. After this speech of welcome, and on behalf of UNDP and UNEP, the representative of UNEP declared the meeting open. He thanked the Government of the Republic of Malta for the initiatives it had taken and for hosting the meeting. He also thanked the United Nations bodies and specialized agencies who had contributed to the preparations for the meeting. He reminded the participants that the regional co-operative programme on the development of which they were requested to advise and make recommendations, should be seen first within the overall mandates of UNDP and UNEP, and second, within the framework of the Mediterranean Action Plan. He added that the programme to be elaborated by the Meeting would be submitted to the Government for consideration and approval.

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<sup>1/</sup> Document UNEP/IG.11/4, para. 33.

5. The representative of UNDP expressed his gratitude to the host country on behalf of his organization. He reconfirmed to the meeting that UNDP stood ready to support specific action-oriented activities that would assist Governments in their joint development efforts on a sub-regional or regional basis. He indicated that projects that might develop out of the meeting which would be relevant to other Arab and European countries should be open to participation by these countries if they so wished.

Agenda Item 2 : Adoption of the agenda and suggested time-table

6. The meeting adopted the agenda contained in Annex II to this report. The meeting also agreed to the suggested time-table as presented in document UNEP/WG.20/2, page 4.

7. The meeting was co-chaired by representatives of UNEP (Mr. Peter S. Thacher) and UNDP (Mr. Stig Anderson and Mr. J. Peter Prins).

Agenda Item 3: Review of the present state of research and studies on renewable sources of energy in the Mediterranean region and their utilization

8. Under this item, participants reviewed and commented on document UNEP/WG.20/3. This document gave a brief outline of the present state of research and studies on renewable sources of energy in the Mediterranean region at the time the UNDP/UNEP fact-finding mission visited the region in mid-1978. Additional information was provided in documents UNEP/WG.20/INF.3 and its addenda 2/ as well as UNEP/WG.20/INF.4. Furthermore, several experts circulated information documents on their national activities and centres. Representatives of the United Nations, Specialized Agencies and regional organizations also provided the meeting with detailed information and comments.

9. The meeting felt that, while document UNEP/WG.20/3 and the other information documents served their purpose well, it would be useful to identify the precise activities undertaken in each country and the method of implementation. Two suggestions were made: the first would add annexes to document UNEP/WG.20/3 covering national and regional activities. The second proposed the preparation of a loose-leaf directory of national institutions and experts engaged in the field of renewable sources of energy.

10. One element in all interventions on this subject was the importance of a mechanism for documentation and information exchange.

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2/ For the list of documents see Annex III to this report.

Agenda Item 4 : Potential uses of renewable sources of energy in the Mediterranean region.

11. The participants outlined the relevant potential uses of renewable sources of energy in the Mediterranean region, taking into consideration the characteristics of the region and available resources.
12. It was clear that, for the time being, most Governments were placing more emphasis on energy conservation than on the development of renewable sources of energy. Under such circumstances several experts felt it was essential that Governments should be called upon to promote actively the use of renewable sources of energy. For instance, Governments could undertake campaigns of public awareness, provide administrative and financial incentives both to the consumers and producers of renewable sources of energy equipment and appliances. Governments could also promote, through different measures in the medium and long run, the integration of renewable sources of energy in architectural design, building and urbanization in general.
13. It was pointed out that as far as the uses of renewable sources of energy were concerned, some countries needed to pursue energy substitution while others would have to introduce renewable sources of energy where no other sources existed. However, priorities in applications, because of different geographical, climatic and development needs might be different from one group of countries to another. Thus, co-operation would have to be geared towards those areas of common interest and those where one group of countries could provide assistance to the other.
14. The discussions highlighted the need for assisting developing countries in establishing their energy balance sheets and in integrating the use of renewable sources of energy in their energy development strategies. Developing countries should also be assisted in identifying practical applications of renewable sources of energy which would satisfy their needs in the most appropriate way. Assistance should also cover identification of energy research and development projects.
15. It became progressively clear that the potential uses of renewable sources of energy were intimately linked to the countries' socio-economic development issues. For Mediterranean developing countries, most of which are located in arid and semi-arid zones, renewable sources of energy could play a major role in dealing with problems associated with their geographic and climatic conditions; two such uses were stressed, namely water desalination and distillation, and water pumping. The availability of fresh water and alternative energy resources, in this context, were clearly linked with soil protection and desertification problems, agricultural development issues and human settlements.
16. The meeting reviewed other significant potential uses of renewable sources of energy in the Mediterranean region. After thorough discussion a provisional order of priority of their utilization and their possible application was agreed upon. The meeting's recommendations on this matter are reflected under the next agenda item and in Annex IV to this report.

Agenda Item 5 : Formulation of the elements of a co-operative programme on the practical applications of renewable sources of energy in the Mediterranean region including institutional arrangements.

17. Document UNEP/WG.20/4, as well as the relevant information documents submitted by the participants, were reviewed and the meeting agreed that the following subjects could be considered as priority elements of a possible co-operative programme:

- (i) solar water heating;
- (ii) solar water desalination and distillation;
- (iii) solar space heating (by collector systems);
- (iv) solar drying;
- (v) greenhouses;
- (vi) production of biogas;
- (vii) appropriate architectural design (passive heating and cooling systems);
- (viii) wind electricity generation;
- (ix) solar electricity generation;
- (x) water pumping by means of wind energy;
- (xi) use of biomass by direct combustion;
- (xii) solar refrigeration (particularly for food preservation);
- (xiii) storage of thermal energy;
- (xiv) solar water pumping;
- (xv) wind production of mechanical energy.

18. This list of identified subjects corresponds to the present level of scientific and technological development or the present level of applicability which varies greatly from country to country and from subject to subject. Annex IV to this report provides further clarification on the activities which could be undertaken in connexion with each of the subjects listed.



19. The following general principles were agreed upon in the formulation and implementation of the co-operative programme:

- (i) the overall objective of the programme should be the strengthening of national capabilities, through regional co-operation, in the development and utilization of renewable sources of energy;
- (ii) the highest priority should be assigned to activities which are of greatest interest to the largest number of countries;
- (iii) the programme should be co-ordinated with ongoing and planned national and regional programmes, in particular with those of the European Economic Community (EEC), and the Arab League Educational, Cultural and Scientific Organization (ALECSO), and the relevant United Nations Regional Economic Commissions, and should take full advantage of the experience and activities of the specialized agencies of the United Nations system.
- (iv) the programme should be flexible, reviewed periodically (not less than once a year) and easily adaptable to the changing requirements;
- (v) the programme should be considered as part of the Mediterranean Action Plan and should be linked through the Priority Actions Programme with other activities of the Action Plan.

20. The various activities, agreed as potential elements of the co-operative programme, were, without order of priority:

- (i) exchange of information; types of information could include: information on sources of information, technical documentation, information on availability and suitability of various products, information on institutions, experts and programmes relevant to research and development in the field of renewable sources of energy;
- (ii) technical assistance covering visits of experts, deployment of equipment, provision of maintenance services, assistance in identifying national problems, requirements and energy goals relevant to the programme, etc.;
- (iii) training in various fields, in particular for trainees from developing countries; meetings of experts, training courses, demonstration courses, study tours, workshops, seminars, etc.;
- (iv) longer range assessment of the potential use of energy resources and requirements in the Mediterranean countries (energy balance) to be undertaken on the specific request of a country or a group of countries;

- (v) research and development relevant to the improvement of existing and/or promotion of new technologies;
- (vi) construction of prototypes, using the services of industry to the largest possible extent;
- (vii) measuring of technical performances and assessment of suitability of equipment under various field conditions;
- (viii) standardization of methodologies used for testing of equipment;
- (ix) monitoring of environmental parameters relevant to the utilization of renewable sources of energy (solar radiation, wind energy), standardization and intercalibration of equipment used for this monitoring.

21. The modalities of co-operation were discussed extensively, taking into account the various written and oral proposals submitted to the Meeting. It was agreed that

- (i) the co-operative programme should be based on activities of national institutions designated by their Governments as participants in the programme;
- (ii) the institutions designated to participate in the programme could be organized in co-operative network(s) with specific and complementary roles (information, differentiation, documentation facilities, building and testing of prototypes, research and development, etc.);
- (iii) the overall co-ordination of the programme, in its initial stage, could be undertaken by the office of UNEP co-ordinating the Mediterranean Action Plan, in close co-operation with UNDP, and the Priority Actions Programme (PAP) unit in Split. 3/

22. The offers of the representatives of Malta and Turkey, to act as regional centres for certain activities envisaged according to this programme, were welcomed with appreciation. The meeting reached agreement, subject to further consideration and approval by the forthcoming Intergovernmental Meeting of Mediterranean Coastal States (February 1979), that

- (i) the centre to be established in Malta should perform functions of regional relevance in the areas of exchange of information, technical assistance and training envisaged in paragraphs 20 (i), 20 (ii) and 20 (iii);
- (ii) the existing national centre in Turkey should be considered as a centre for specific regional activities in research and development in solar energy.

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3/ See documents UNEP/IG.5/7, paras. 40 - 52, and 54; and UNEP/IG.11/4, paras. 21 - 38, and annex IV, para. 26.

23. The meeting requested UNDP and UNEP to prepare, in consultation with Governments, a draft plan of action for the co-operative programme proposed by this meeting to prepare a project design for, and a financial appraisal of, the establishment and strengthening of the centres in Malta and Turkey respectively, and to submit a concrete proposal to the Meeting of Mediterranean Coastal States (scheduled for February 1979) which would comprise financial implications for Governments and international organizations.

24. The representatives of UNDP and UNEP stated that the financial resources needed for the activities envisaged in this programme should be provided by the participating Governments in the programme, supplemented to the extent possible by funds from the international organizations supporting the programme (UNDP, UNEP and perhaps others).

Agenda Item 6 : Adoption of the report including recommendations

25. The meeting adopted its report on agenda items 1 to 5. As is customary, it was understood that the UNDP and UNEP secretariats would make the necessary editorial changes in the report without affecting the substance.

Agenda Item 7 : Closure of the meeting

26. Before its closure on 13 October 1978, the meeting expressed its appreciation and gratitude for the courtesy and hospitality extended by the Government of the Republic of Malta to the Government Experts, observers and the secretariats attending the meeting.



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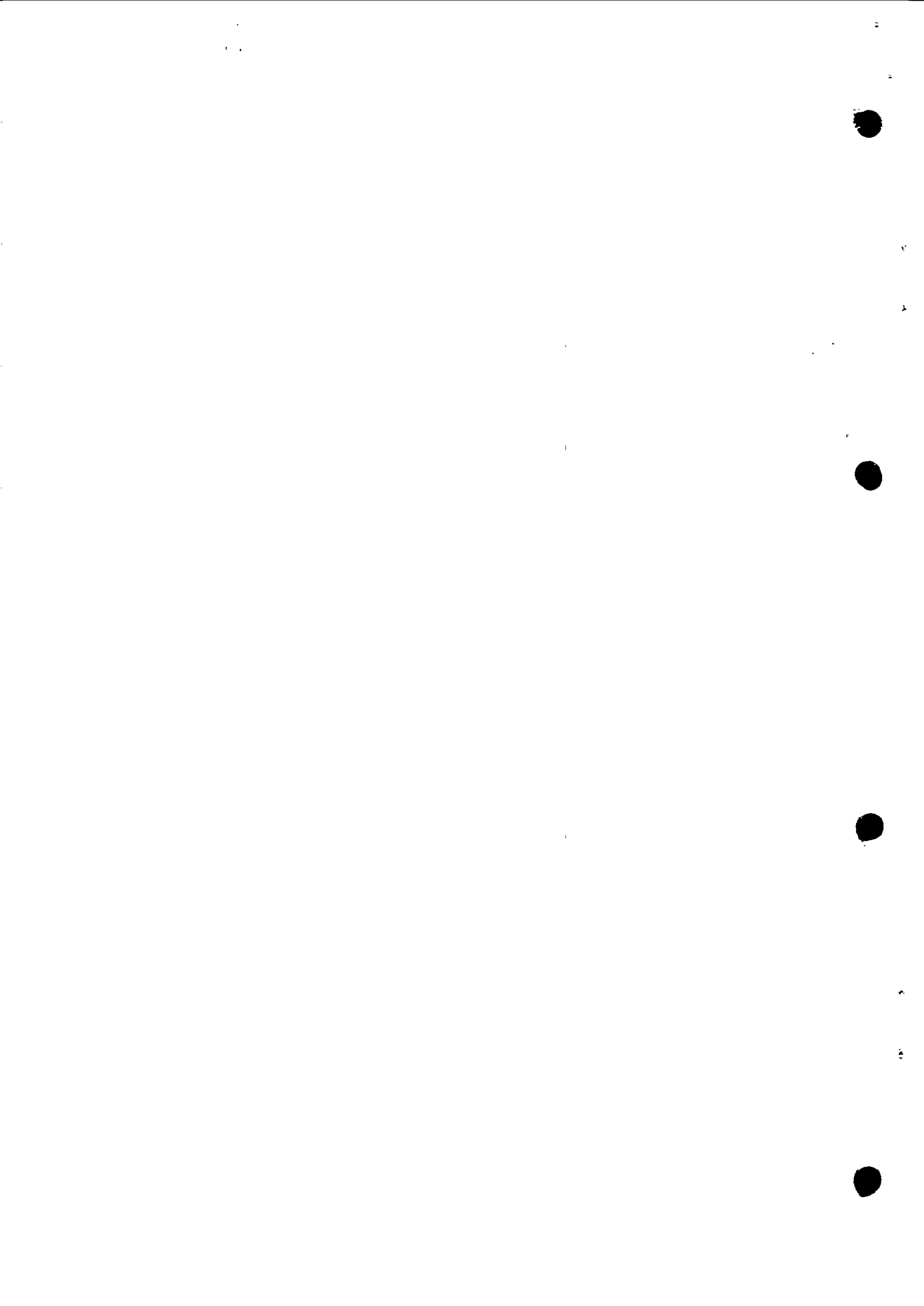
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ANNEX II

Agenda

1. Opening of the Meeting.
2. Adoption of the Agenda and suggested time-table.
3. Review of the present state of research and studies on renewable sources of energy in the Mediterranean region and their utilization.
4. Potential uses of renewable sources of energy in the Mediterranean region.
5. Formulation of the elements of a co-operative programme on the practical applications of renewable sources of energy in the Mediterranean region including institutional arrangements.
6. Adoption of the Report including recommendations.
7. Closure of the Meeting.





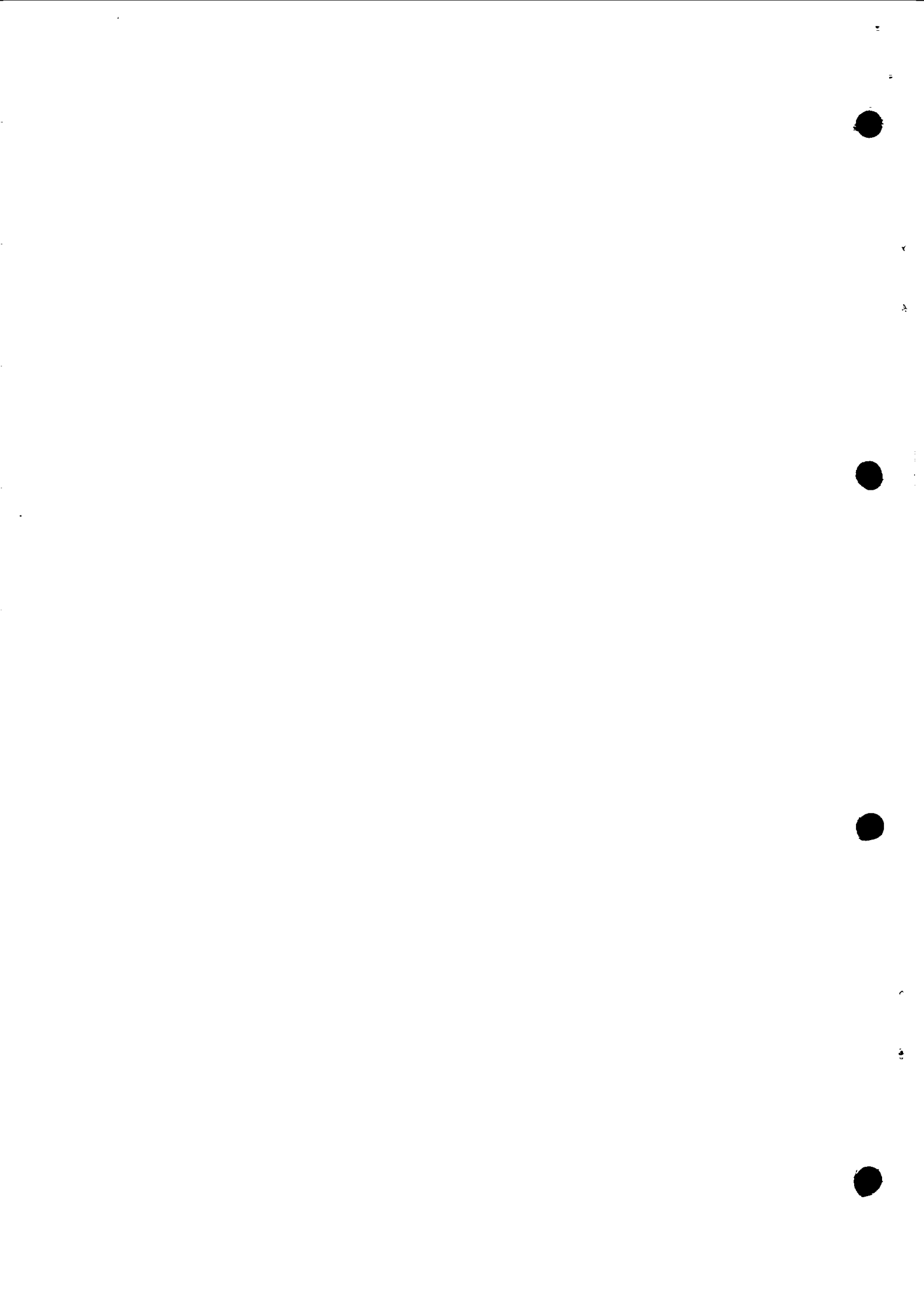
ANNEX III

List of documents

- |              |   |
|--------------|---|
| UNEP/WG.20/1 | Provisional Agenda and draft programme for the meeting.   |
| UNEP/WG.20/2 | Annotated Provisional Agenda.   |
| UNEP/WG.20/3 | Review of the present state of research and studies on renewable sources of energy in the Mediterranean region and their utilization.   |
| UNEP/WG.20/4 | A possible approach to renewable sources of energy in the Mediterranean region and proposed elements for developing a co-operative programme on their practical applications including institutional arrangements.  |
| UNEP/WG.20/5 | Report of the 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. |

Information documents

- |  |  |
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| UNEP/WG.20/INF.1                           | Provisional list of documents.                                       |
| UNEP/WG.20/INF.2                           | Provisional list of participants.                                    |
| UNEP/WG.20/INF.3<br>and addenda 1<br>and 2 | Proposals received from Governments.                                 |
| UNEP/WG.20/INF.4                           | Proposals and information received from international organizations. |



#### ANNEX IV

#### TECHNICAL ELEMENTS WHICH COULD BE CONSIDERED FOR A REGIONAL CO-OPERATIVE PROGRAMME ON THE PRACTICAL APPLICATIONS OF RENEWABLE SOURCES OF ENERGY IN THE MEDITERRANEAN REGION.

In the light of their discussions, the participants in the meeting tentatively prepared a list of priority action areas which could be considered as technical elements for a regional co-operative programme on the practical applications of renewable sources of energy in the Mediterranean area. These topics are listed hereunder and for each of them elements of co-operation have been provisionally indicated for consideration.

There are also four types of action which appeared to be common to all topics and which, consequently, should be considered in each case. They are:

- relative and potential importance in the energy balance of a given community (be it isolated, a village, an urban or national community);
- exchange of information regarding present possibilities and technologies;
- training of installation and maintenance personnel;
- comparative assessment of the results obtained.

Furthermore, in each field, a number of specific activities might be envisaged, such as, for example:

##### 1. Solar water heating

- design, production, testing and development prototypes;
- calibration and standardization of testing procedures;
- economic analysis of systems, including marketing and incentive measures;
- exchange of information on existing or planned legislative measures aimed at promoting the use of water heaters, refitting older buildings, protecting the aesthetic environment, etc.
- possible expansion of principles and systems used for water heating to other applications such as aquaculture, tourism, etc.

2. Solar water desalination and distillation
  - potential applications particularly in isolated communities;
  - design, production and testing and development of prototypes;
  - economic analysis of systems;
  - socio-economic and cultural impact on user communities;
  - integration within energy system.
3. - Solar space heating (by collector systems)
  - design, production, testing and development of prototype systems;
  - economic analysis of systems;
  - environmental aspects.
4. Solar drying
  - potential applications to various drying problems;
  - information concerning experience already gained;
  - impact on the quality and value of the products processed;
  - design, production testing and development of prototypes;
  - economic analyses.
5. Greenhouses
  - adaptation to local conditions;
  - selection of optimum installations meeting local, physical, climatic requirements and having regard to the products to be marketed;
  - socio-economic impact on the region;
  - integration within energy systems.
6. Production of biogas
  - exchange of information on various technologies and materials;
  - adjusting to local climatic conditions;
  - economic impact of end-products;
  - safety measures required;
  - integration within energy system;
  - secondary uses.

7. Appropriate architectural design (passive heating and cooling systems)
  - information concerning the impact on the energy consumption of existing or new architectural design;
  - building materials;
  - integration within energy systems;
  - methodologies for architectural design.
8. Wind electricity generation
  - potential applications for isolated communities;
  - design, production and testing and development of prototypes;
  - integration within an overall production system;
  - socio-economic and cultural impact on user communities;
  - integration within energy systems;
  - environmental aspects.
9. Solar electricity generation
  - potential applications for isolated communities;
  - design, production, testing and development of prototype systems;
  - calibration and standardization of testing procedures;
  - socio-economic and cultural impact;
  - integration within energy systems.
10. Water pumping by means of wind energy
  - design, production, testing and development of prototype systems;
  - socio-cultural impact;
  - environmental aspects.
11. Use of biomass by direct combustion
  - design, installation, testing and development of prototype systems;
  - environmental aspects;
  - integration within energy systems.

12. Solar refrigeration (particularly for food preservation)
  - design, production, testing and development of prototypes;
  - impact on the quality and preservation of the products processed;
  - environmental aspects.
13. Storage of thermal energy
  - comparative testing of materials;
  - impact of climatic conditions;
  - integration within energy systems.
14. Solar water pumping
  - design, production, testing and development of prototypes;
  - socio-economic aspects.
15. Wind production of mechanical energy.
  - design, production, testing and development of prototype systems;
  - socio-cultural aspects;
  - environmental impact.