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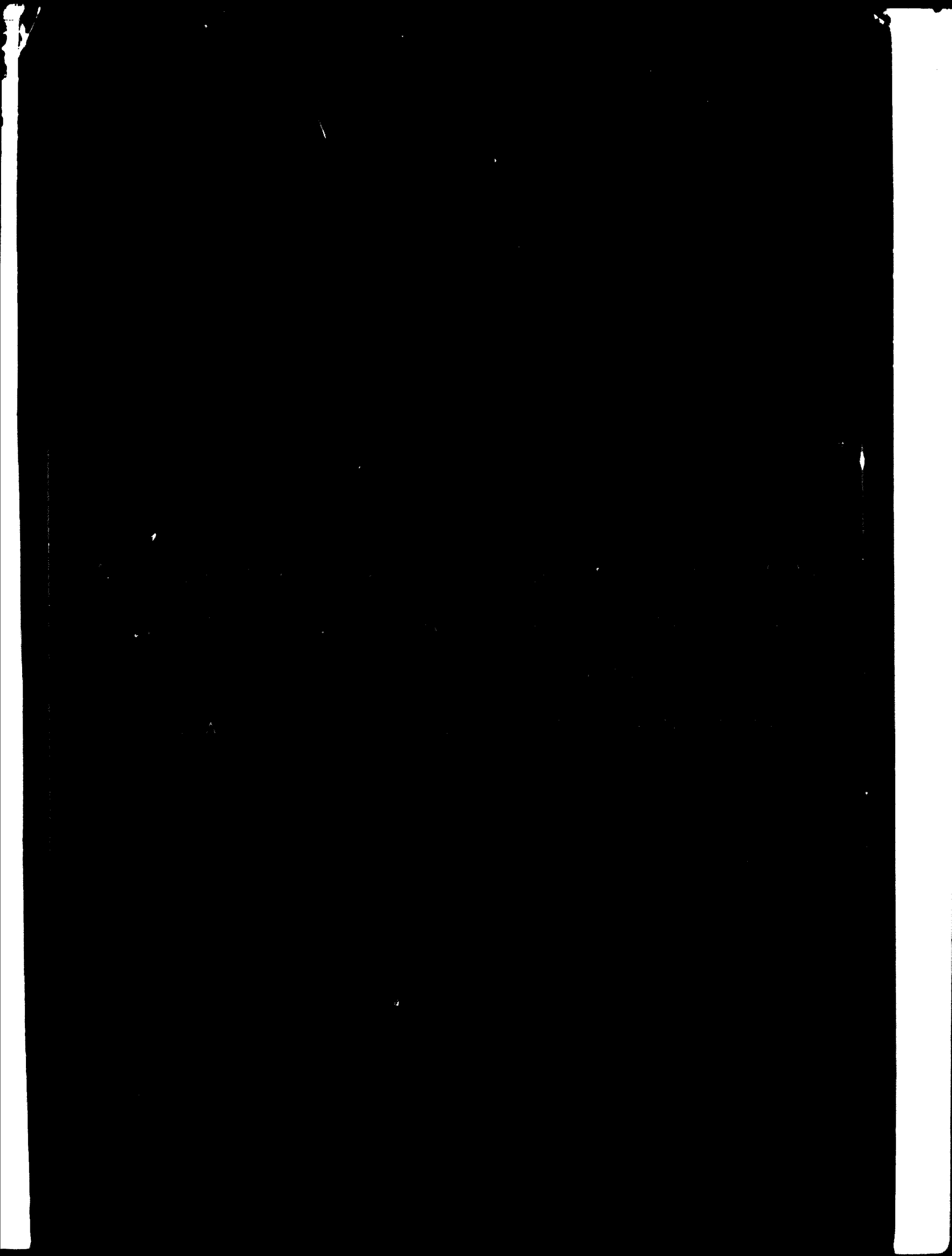
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UNDP/UNEP MEETING OF GOVERNMENT EXPERTS
FOR
DEVELOPING A CO-OPERATIVE PROGRAMME
ON THE
PRACTICAL APPLICATION OF RENEWABLE SOURCES OF ENERGY
IN THE
MEDITERRANEAN REGION
MALTA, 9 - 13 OCTOBER 1978

R E P O R T *

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to Subject Meeting

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1. INTRODUCTION

In the framework of the Action Plan for the protection and development of the Mediterranean Region 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) as well as at the request of the Intergovernmental Review Meeting of Mediterranean Coastal States on the Mediterranean Action Plan (Monaco, 9 - 14 January 1978), 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.

2. ATTENDANCE

The Meeting was attended by experts from fifteen Mediterranean Coastal States (Cyprus, Egypt, France, Greece, Israel, Italy, Libya, Malta, Monaco, Morocco, Spain, Syria, Tunisia, Turkey, Yugoslavia), the European Economic Community and by representatives of nine United Nations bodies, Specialized Agencies and other Organizations.

3. SUBJECT OF THE MEETING

A. Review of the present state of research and studies on renewable sources of energy and their utilization in the Mediterranean region.

B. Potential use of renewable sources of energy in the Mediterranean region.

It was clear that, for the time being, most governments were putting more emphasis on energy conservation rather than on the development of renewable sources of energy.

The discussions highlighted the need for the regional co-operative programme on the practical applications of renewable sources of energy in the Mediterranean region including institutional arrangements. The following general ideas could be considered as summarizing the present state of affairs:

A. Although the basic concepts in many renewable sources of energy (solar, wind, bio-gas, geothermal energy) are centuries old, their industrial and commercial application only recently has aroused significant interest in industrialized and developing countries, largely as a result of the energy crisis.

B. There is no shortage of scientists and specialists interested in Research and Development of renewable sources of energy.

C. There exist, however, serious limitations in equipment and supporting facilities for research.

D. The major problems in the development, product design and manufacture of renewable sources of energy are:

1. The technologies are still mainly experimental and did not reach the industrial technology level yet.
2. The products and equipment are not yet readily available on a commercial basis and on an extensive scale.
3. Industrially experienced experts in manufacture, repair and maintenance of this equipment are scarce.

The above described conditions allow us to consider only the following main fields of practical application of renewable sources of energy:

A. Short-term applications

1. Solar water heating (for domestic purposes);
2. Solar space heating;
3. Solar water desalination and distillation plants;
4. Solar drying;
5. Greenhouses;

6. Production of biogas;
7. Wind electricity generation (small plants);
8. Solar electricity generation (small plants);
9. Water pumping by means of wind energy;
10. Solar refrigeration (particularly for food preservation);
11. Solar water pumping.

B. Longer-term Applications

1. Solar power plants;
2. Wind power plants;
3. Biomass (large-scale plants);
4. Helio-hydro power plants;
5. Solar generation of industrial heat.

In each field of short-term applications, a number of specific activities might be envisaged according to the stage of technological knowledge in the particular field of application:

- A. 1. Solar water heating (for domestic purposes):
- design, development, production and testing of 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 space heating

- design, development, production and testing of prototype systems;
- economic analysis of systems;
- environmental aspects.

3. Solar water desalination and distillation

- potential applications particularly in isolated communities;
- design, development, production and testing of prototypes;
- economic analysis of systems;
- socio-economic and cultural impact on communities of users;
- integration within energy systems.

4. Solar drying

- potential applications to resolve various drying problems;
- information concerning already gained experience;
- impact on the quality and value of the products processed;
- design, development, production and testing of prototypes;
- economic analyses.

5. Greenhouses

- adaptation to local conditions;
- selection of optimum installations meeting local, physical, climatic requirements and in view of 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;
- tuning to local climatic conditions;
- economic impact of final products;
- safety measures required;
- integration within energy systems;
- secondary uses.

7. Wind electricity generation (small plants)

- potential applications for isolated communities;
- design, development, production and testing of prototypes;
- integration within an overall production system;
- socio-economic and cultural impact on communities of users;
- integration within energy systems;
- environmental aspects.

8. Solar electricity generation (small plants)

- potential applications for isolated communities;
- design, development, production, testing of prototype systems;
- calibration and standardization of testing procedures;
- socio-economic and cultural impact;
- integration within energy systems.

9. Water pumping by means of wind energy

- design, development, production and testing of prototype systems;
- socio-economic impact;
- environmental aspects.

10. Solar refrigeration (particularly for food preservation)

- design, development, production and testing of prototypes;
- impact on the quality and preservation of the products processed;
- environmental aspects.

11. Solar water pumping

- design, development, production and testing of prototypes;
- socio-economic aspects.

As we may see from the above mentioned technical elements of the practical applications of renewable sources of energy in particular fields, the majority of these topics are still in the pre-industrial stage of development. Hence the fundamental conclusion:

The practical application of renewable sources of energy on industrial scale is still in the research and development stage.

Role of UNIDO in the Development of Renewable Sources of Energy

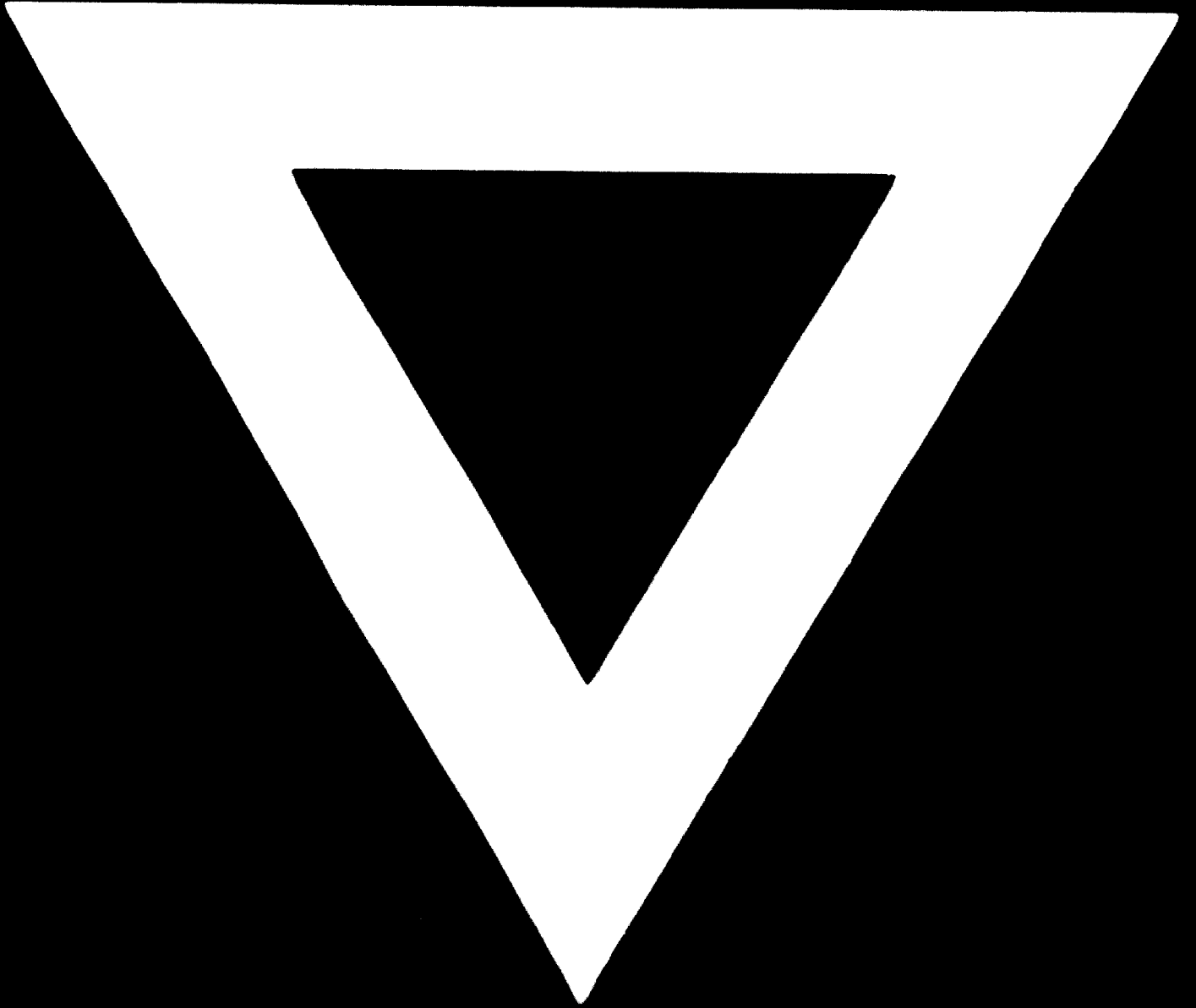
1. I am convinced that all the work now being done in industrialized and developing countries will bring valuable results in the near and long-term future.
2. UNIDO should, in my opinion, play an active and important role in the industrial application of renewable sources of energy.
3. UNIDO should be actively involved in rendering technical assistance to developing countries within the industrially approved and tested technologies which can provide immediate assistance to them with products that only need to be adapted to their requirements and potentials.
4. Research work and studies of the practical applications of renewable sources of energy should, in my opinion, be performed by UNESCO for the following reasons:
 - (a) UNESCO has been dealing with this question for more than seven years and has achieved positive results;
 - (b) To guarantee adequate division of programmes within the United Nations.

4. CONCLUSIONS

An agreement should be signed between UNIDO and UNESCO, stating clearly the responsibilities and division of work in the area of renewable sources of energy.

Within the organizational scheme of UNIDO I believe that all operational activities dealing with approved projects of technical assistance in industrially tested technologies and products of renewable sources of energy should be handled by the Engineering Industries Section. Yet, within this scope technical assistance should only be provided in the manufacture and repair and maintenance of equipment that can be produced at reasonable, competitive prices in developing countries for the practical application of renewable sources of energy.

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