



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

21872

Distr.
LIMITEDITPD.30(SPEC.)
7 July 1997UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ORIGINAL: ENGLISH

Expert Group Meeting on Capacity
Building for the Establishment of
a Network of Solar Energy Centres
for Selected African Countries

Maseru, Lesotho, 7-9 April 1997

REPORT*

* This document has not been edited.

V.97-25431

CONTENTS

	<u>Paragraph</u>	<u>Page</u>
BACKGROUND	1-4	3-4
INTRODUCTION	5-6	4
ATTENDANCE	7	4
AGREED CONCLUSIONS AND RECOMMENDATIONS	8-17	5-9
 <u>Chapter</u>		
I. ORGANIZATION OF THE EXPERT GROUP MEETING	18-21	10-12
II. SUMMARY OF DISCUSSIONS	22-36	12-16
 <u>Annex</u>		
1. LIST OF PARTICIPANTS		17-20

BACKGROUND

1. The Post-World Energy Conference has encouraged most developing countries to foster the development of cost-effective and environmentally sound energy systems, through the application of renewable sources of energy (RSE), with a view to mitigating climate damage in developing countries. Great attention is paid to this issue in the work of the United Nations Commission on Sustainable Development (CSD).

2. It is in this context that the United Nations Industrial Development Organization (UNIDO) established a Consultative Group of Solar Energy Research and Application (COSERA) for enlarging international cooperation and enhance the effectiveness of solar energy research in developing countries. To this end, COSERA endorsed UNIDO's proposal to create the Centre for Application of Solar Energy (CASE) in Perth, Australia, in order to assist the emerging RSE in developing countries to penetrate world markets with reliable cost-effective products and systems.

3. It is against this background that UNIDO and the Government of Lesotho organized from 7 to 9 April 1997, in Maseru, an Expert Group Meeting (EGM) on Capacity Building for the Establishment of a Network of Solar Energy Centres in selected African Countries to contribute to the development of RSE industry in those countries. The purpose of the meeting was to work out the critical issues involved in the development, application and transfer of RSE-related technologies with a view to developing a strategic framework for establishing and/or strengthening national centres for RSE in Africa and networking.

The EGM was articulated around the following four themes:

- overview of issues involved in the development and application of RSE;
- issues on the supply and demand sides of RSE systems;

- new support initiatives.

4. The in-depth deliberations during the EGM were facilitated by country case studies prepared by the experts, along with special presentation by UNIDO, International CASE, Perth, Australia and participants.

INTRODUCTION

5. This EGM on Capacity Building for the Establishment of a Network of Solar Energy Centres for Selected African Countries was held as a follow-up action to UNIDO's proposal to the World Solar Summit in Harare, Zimbabwe, in September 1996. The meeting was hosted by the Lesotho Government with funding from the United Nations Industrial Development Organization (UNIDO).

6. The objectives of the meeting were twofold:

- First, to exchange information and share experience among African institutions and bring together expertise both from inside Africa and outside to assist in the promotion, development and application of RSE technologies in the selected countries.
- Secondly, to identify the national focal points & work out the critical variables of a strategic framework for networking national RSE centres in Africa.

ATTENDANCE

7. Some 22 experts attended the Expert Group Meeting in their own capacity. They were drawn from a wide spectrum including representatives from Energy Ministries of selected African countries, namely, Botswana, Ethiopia, Lesotho, Malawi, Namibia, Tanzania, Uganda and Zambia; private firms, research community and keynote speakers from Australia, India and China. A list of participants is attached as Annex 1.

I. AGREED CONCLUSIONS AND RECOMMENDATIONS

Preamble

8. UNIDO in collaboration with the Government of Lesotho held an Expert Group Meeting (EGM) on Capacity Building for the Establishment of a Network of RSE Centres in Selected African Countries in Maseru from 7 to 9 April 1997.

9. The presentations given by all participants revealed the growing recognition of alternative energy sources - RSE and energy conservation, as an essential route for the future in providing energy services to people, particularly to people living in remote areas not grid connected. For this to happen, the experts urged national governments to show a strong political will, and act as catalysts for the development and application of RSE with focus on solar photovoltaic and/or solar thermal.

10. The provision of RSE services should be fully integrated into national energy development strategies to enable African countries lift up the living standards of rural communities/households and to contribute to mitigate climate change. In this respect, and in order to achieve socio-economic progress, the private sector firms, NGOs, financing agencies and the donor community should commit themselves to promoting the development and application of RSE technologies by investing in sound bankable projects.

11. In this respect, existing national RSE institutions should be further strengthened, and where they do not exist, new institutions should be established to carry out specific activities leading to the development of feasible and viable investment projects, instead of concentrating mostly on R & D activities.

12. To support these initiatives to reach their objectives the EGM set out the key constraints inhibiting RSE development and application and adopted specific recommendations to overcome them. These were:

Constraints

13. The EGM recognized that the development and application of RSE technologies in African countries had been uneven and disjointed. In general the provision of RSE services suffer from the following constraints:

- a) National policies and strategies varied from country to country and sometimes failed to provide the necessary incentives for the promotion, development and utilization of RSE because of lack of governments' commitment and strategic focus.
- b) Shortage of experienced technical staff combined with lack of managerial capacities, especially in the field of marketing and development of creative financing mechanisms.
- c) A number of agencies dealing with RSE application in Africa were confronted with a host of difficulties in their operations due in most cases to poor institutional infrastructure.
- d) Lack of domestic design and manufacturing capability in RSE in Africa.
- e) Non-existing, weak and ill-coordinated information system/data banks among the countries concerned regarding RSE technology and opportunities for application, technological up-grading and acquisition of new skills.
- f) Dearth of needs assessment to identify the bottlenecks involved in the potential use of RSE by the target groups.
- g) Present financial support mechanisms for the development and promotion of RSE in rural areas have produced mixed results.

- h) Absence of established standards to protect the end-users from purchasing sub-standard equipment.
- i) Frequent theft of, and vandalism on installed solar systems are common problems within the countries.

Measures and Action to Improve the Present Situation

I. National Governments

14. The Expert Group Meeting emphasized that the role of Governments was crucial for an effective development and application of RSE technologies. To that effect the meeting felt that national governments should:
- a) Adopt consistent policies and strategies, including appropriate laws and legislation wherever necessary, to strengthen national institutions to promote the utilization of RSE.
 - b) Support up-grading of local skills by designing suitable training programmes to enhance the capacity of national staff.
 - c) Facilitate the provision of services and timely up-to-date information on available alternative energy technologies through networking, taking into account the existing sub-regional groupings.
 - d) Define and put into force equipment standards and codes of practices that meet recognized requirements at national and or international levels. Establish test facilities and develop new legal structures to ensure that standardization measures for local production and application of RSE are adhered to.

e) Promote technical co-operation to enhance the domestic capabilities in design, manufacturing and technology adaptation through available multi- or bilateral funds.

II. National Renewable Energy Promotion Agencies

15. The Expert Group Meeting emphasized the need for focal points at the national level to encourage the promotion, development and application of RSE. These focal points could be in the form of national Centres for the Application of Solar Energy (CASE), which should:

- a) Carry out needs assessment for RSE application in the country with a view to identifying constraints and possible options to provide cost-effective RSE services, and ensure their wide application, particularly in rural areas.
- b) Make greater efforts to develop innovative financial mechanisms to interact with funding agencies and local banks on issues of energy policies and their implementation. In this regard, the meeting urged development banks to agree on signing a memorandum of understanding to provide loan schemes by using their own or donor funds as alternatives. In addition, training programmes including workshops, seminars, etc. should be provided to the staff of financial institutions to enable them to appraise and administer funds devoted to promote RSE application.
- c) Create greater public awareness of the advantages and benefits associated with RSE hardware, and establish protective measures including sensitizing campaigns to change people's attitudes, thereby reducing the damage and loss of installed equipment and systems.
- d) Solicit support from international organizations such as UNIDO/CASE and others for the promotion and enhancement of their activities.

III. International Bodies

16. The Group of Experts recognized the significant contribution that international bodies can make to encourage the involvement of national CASEs in projects funded and supported by multilateral and bilateral funds. The meeting, therefore, stressed that:

- a) International bodies, particularly UNIDO and International CASE should help establish national CASEs on merit and develop support programmes in areas such as project development and formulation, technology acquisition and adaptation, energy management, etc. UNIDO was requested to organize a study tour, as an integral part of the programme on capacity building and networking process.

- b) Networking and training opportunities for exchange of information and sharing of experience amongst African countries, Asia and the developing world at large should be established and supported by international bodies in an effective manner.

IV. International Collaboration

17. The Meeting viewed the establishment of mutually beneficial relations between the national Centres of Application of Solar Energy (CASEs) of different countries and regions as one of the more effective ways of helping the growth of companies manufacturing RSE equipment; the key objective of which was to strengthen the domestic services capacity of the countries concerned.

Consequently, the meeting considered that international collaboration should:

- a) Also encourage effective and durable South-South co-operation in specific areas that would lend themselves to set up joint ventures with focus on technology transfer and training.

- b) Reveal effective opportunities for the development and application of RSE. UNIDO was requested to help in this regard.

II. ORGANIZATION OF THE EXPERT GROUP MEETING **OPENING OF THE MEETING**

Statement by the Principal Secretary of the Ministry of Natural Resources of Lesotho

18. The Principal Secretary welcomed the participants to Maseru. She described the importance of the application of RSE , especially solar, to African economies including Lesotho, as a development factor for generating substantial electricity to meet energy requirements not only in the commercial and industrial sectors but also in the development of rural areas.

19. The Principal Secretary urged the Meeting to put forward policy measures and other innovative mechanisms for the development and cost-effective utilization of RSE, that will involve the public and private sectors including NGOs as stakeholders in the business of RSE for rural development. She disclosed that it was the SADC policy to promote information sharing as one of the areas where meaningful cooperation could be achieved. Thus, a network of solar energy centres was consistent with energy policies and strategies of the SADC. She therefore felt that this meeting was relevant to, and timely for, SADC member states and particularly for the Kingdom of Lesotho.

Statement by the Representative of UNIDO ECDC/TCDC Coordination Unit

20. UNIDO's strategic message to the Expert Group Meeting stressed the need to develop an institutional policy framework that will help African countries - through the establishment of National Centres - to strengthen the capacity and enhance the capabilities of the latter to develop programmes and projects in renewable energies for rural communities and thereby contributing to rural development and poverty alleviation.

Election of Officers

The following officers were elected:

- Chairman: T. Phuroe (Lesotho), Deputy Director, Ministry of Natural Resources, Department of Energy
- Vice-Chairman: E.L.N. N'Gwandu (United Republic of Tanzania), Director of Rural Technology, CAMARTEC
- Rapporteur: H.W. Chitonje (Malawi), Principal Energy Officer, Ministry of Energy and Mining

Adoption of the Agenda

The following agenda was adopted:

1. Opening of the Expert Group Meeting
2. Election of the Chairman, Vice-Chairman and Rapporteur
3. Adoption of the Agenda and organization of the work
4. Presentation of organization/country papers
5. Discussion of the themes:
 - How best to promote solar energy in Africa at affordable cost.
 - What policy and institutional support should be sought from governments and local business community for the development and growth of solar energy industries
 - How international cooperation and collaboration can be strengthened.
6. Identification of, and discussion on, key issues to be addressed; and priority elements for an action programme.
7. Adoption of Conclusions and Recommendations
8. Closure of the Meeting

ADOPTION OF THE REPORT

21. The report of the Expert Group Meeting on Capacity Building for the Establishment of a Network of Solar Energy Centres for Selected African Countries was adopted at the final working session on 9 April 1997.

III. SUMMARY OF DISCUSSIONS

22. After the introduction of the subject by the UNIDO staff member, the expert from the International Centre for Application of Solar Energy (CASE) - established in Perth, Western Australia, working under the auspices of UNIDO - disclosed the elements of CASE's capability statement, focussing on areas of possible cooperation with other national institutions in developing countries.

23. The representative of India, as a Resource Person, gave an account of the world photovoltaic (PV) scenario. He highlighted the 1970's energy crisis and the environment concern. He pointed out that since the conventional energy sources were not renewable, a number of national governments had taken bold initiatives together with concerned development partners such as NGOs, parastatals and private enterprises in order to promote RSE as alternative. He indicated that by the year 2000 the cost per Kw/h of energy could be reduced using advanced technologies. He also stated that there were expectations that PV use would have grown exponentially if individual countries showed political will to drive the development of solar energy use. In this regard, participants questioned what would stimulate the exponential growth of PV use by the year 2000. He replied that technology improvement and access to funds such as the Global Environment Facility (GEF) and the World Bank soft loans and/or grants could help stimulate that growth. As a result, it was agreed that there was a need to encourage power pool systems, as already practised in some parts of the world, where power crossed borders from one country to another on commercial basis. SADC Energy Protocol was cited as an example.

24. Then the participants presented their papers based on their practical experience in managing the development and application of renewable sources of energy in their respective countries. In general these papers focused on three major problem areas:

- (a) National policy, regulatory frameworks for the development of renewable sources of energy;
- (b) Implementation of these frameworks and;
- (c) Opportunities for international and regional cooperation and technical assistance requirements

25. Presentations made by all the representatives of selected African countries revealed the extreme concern of African countries who continued to be confronted with high initial capital investment in the application of renewable sources of energy, let alone the problems of access to credit, energy needs and market intelligence, industrial information, limited private sector capacity in manufacturing, distribution, installation and maintenance etc. In that context, it was suggested that governments had to experience the cost of RSE development and application by introducing some incentives through removing/reducing duties on imported materials used in manufacturing RSE appliances. It was also argued that since national governments recognized the potential of RSE to complement conventional energy, to provide services to rural communities, there must be effective policy instruments to facilitate the development of this source of energy.

26. The necessity to identify specific RSE needs was mentioned several times. Indeed, participants believed that, in all cases, developmental needs would require solutions compatible with sustainable use of solar energy. Meeting this challenge should form the basis for the design and adoption of RSE incentives and regulatory measures. Solutions to these problems called for high-level political commitment and support if identified rural electrification needs had to be met.

27. Most participants emphasized the role of the private sector in providing RSE-related systems. In this regard, they observed that technologies transferred from one country to another could not always perform as expected. Performance would vary according to local level of expertise, technical education of workers, end-users as well as infrastructure and other socio-cultural differences. The need for technology adaptation through technical skill upgrading in the transfer process was stressed as a crucial contribution to capacity building.

28. All participants recognized the weakness, absence or even failure of local financing institutions to help bring RSE services to rural areas. Therefore, new and appropriate funding schemes would need to be developed, and the experts called upon multi- and bilateral financial agencies, national development banks, the private sector to come up with innovative and specialized loan schemes to support the development and promotion of RSE systems by using their own or donor funds.

29. The question of standardization of RSE equipment was raised, as well as the problem of repeated thefts and vandalism were discussed extensively. The experts agreed that African countries should adopt existing and proven standards or establish new ones together with test facilities, codes of practices that meet national and international recognized standards. For this purpose, accompanying legal policy measures were required both to protect the end-users from sub-standard equipment and reduce the frequency of loss of installed RSE systems.

30. Some participants felt that national institutions dealing with the development and application of RSE were not sufficiently mature in substance to produce a significant impact and so required an effective programme of assistance. This assistance might be premised on such elements as (i) technical knowledge and managerial experience; (ii) analysis of problems and constraints to overcome, and (iii) action plans.

31. In this regard, most participants considered that new and innovative institutional responses would be needed to effectively address the problem of development, application and transfer of RSE technologies. New institutions, particularly those still to be established might offer a potential route to enhance the positive impact of technology transfer process. It was agreed that measures supporting these developments should include international organizations such as UNIDO.

32. All participants recognized the tangible contribution made by international cooperation in providing technical services to support the development and application of RSE for rural electrification to improve living standards of rural communities in developing countries. However, for most African countries, technical and organizational skills, information technology flow, technological learning and marketing know-how would have to be developed and strengthened to this end. The meeting therefore stressed the need for African countries to exchange available information and expertise among themselves as well as between Africa and other developing regions through networking. International institutions such as UNIDO were requested to support such efforts.

33. The EGM considered the establishment of mutually beneficial relations between national centres of application of RSE of different countries and regions as one alternative to effectively contribute to the development of RSE application in Africa. More specifically, it was suggested to tap the vast potential of South-South cooperation by organizing focused study tours for selected African representatives to target European and Asian countries as an integral part of capacity building and networking process. UNIDO was requested to support these initiatives.

34. The question of why International CASE had so far concentrated most of its activities in South-East Asian countries rather than Africa was raised. The representative of CASE indicated that funding had always been a major constraint for CASE, stretching its assistance to other developing regions, particularly to

Africa. However, he said that the participation of CASE in this particular meeting should be seen as an important step at reaching that goal. Specifically, he indicated that demonstration projects on RSE should be considered; but for that to happen, there was a need to foster regional cooperation

35. With regard to regional cooperation, most participants disclosed that evidence had shown that the regional approach had often failed to yield the expected results, and needed to be revisited. The consensus that emerged indicated that, as a first step, National Centres on Application of RSE should be established and strengthened before going Regional. By so doing, each African country should commit itself at the national level in putting forward adequate policies and strategies geared to the development and promotion of RSE. In this respect, international bodies such as UNIDO were called upon to review the programmes of regional centres to assess those bottlenecks that contributed to project failures in the African Region.

Annex 1

LIST OF PARTICIPANTS

1. Botswana
Mr. B. Mogotsi
Senior Energy Officer
Energy Affairs Divisions
Ministry of Mineral Resources and Water Affairs
Gaborone
Tel: 267-314-221
Fax: 267-314-201

2. China
Prof. Wenhua Xi
Gansu Natural Energy Research Institute (GNERI)
730000 Gansu
Tel: 86-0931-8611441, 8616243 (office)
Tel: 86-0931-8620635 (home)
Fax: 86-0931-8616243

3. Ethiopia
Mr. Gebeyehu Wolde Gashaw
General Manager
Engineering Design and Tool Enterprise
Addis Ababa
Tel: 251-1-611899, 614407
Fax: 251-1-613698, 611849

4. India
Dr. M.R.L.N. Murthy
Semicon Tech Consultants
302, Sahara Apartments
Deonar Farm Road
Deonar, Mumbai - 400088
Tel: 91-22-556479
Fax: 91-22-5563615

5. Lesotho

Private Sector

Mr. Titus Lesofe
Project Manager
Sechaba Consultants

Ms. Nthamane Malepa
Research Assistant
Baffoe and Associates
P.O. Box 7590
Maseru 100
Tel: (+266) 312269
Fax: (+266) 310167

Ms. Seipati Molapo
Research Assistant
Baffoe and Associates
P.O. Box 7590
Maseru 100
Tel: (+266) 312269
Fax: (+266) 310167

Dr. Frank Baffoe
Managing Director
Baffoe and Associates
P.O. Box 7590
Maseru 100
Tel: (+266) 312269
Fax: (+266) 310167

Mr. I. Seifert
Ingo's T.V. Centre

Mr. M. Nkotsi
Chairperson
Lesotho Consumer Organization

Ms. Eolkins-Gibson
Managing Director
Solar Matla Lesotho (Pty.) Ltd.
The Basotho Hat
Kingsway
P.O. Box 4307
Maseru 104
Tel: (+266) 311011
Fax: (+266) 310081/317816/310492

Public Sector

Mr. Kopano L. 'Malehi
Research Officer
Science and Technology
Ministry of Natural Resources

Mr. Paul M. Mathaha
Acting Head of RE Division
Department of Energy
Ministry of Natural Resources
Private Bag A91
Maseru 100
Tel: (+266) 310460
Fax: (+266) 310360
e-mail: solarwind@lesoff.co.za

Mr. L. Mokhutsoane
Renewable Energy Officer
Department of Energy
Ministry of Natural Resources
Private Bag A91
Maseru 100
Tel: (+266) 310460
Fax: (+266) 310360
e-mail: solarwind@lesoff.co.za

Mr. Thabang Phuroe
Deputy Director
Department of Energy
Ministry of Natural Resources
Private Bag A91
Masru 100
Tel: (+266) 322619
Fax: (+266) 310360
e-mail: solarwind@lesoff.co.za

Mr. J. Selttheke
Renewable Energy Officer
Department of Energy
Ministry of Natural Resources
Private Bag A91
Maseru 100
Tel: (+266) 310460
Fax: (+266) 310360
e-mail: solarwind@lesoff.co.za

6. Malawi
Mr. Harry Chitenje
Principal Energy Officer
Ministry of Energy and Mining
Lilongwe
Fax: 265-722772

7. Namibia
Mr. Albert E. Biwa
Ministry of Mines and Energy
Windhoek
Fax: 264-61-253671

8. Tanzania
Mr. E.N.L. Ng'wandu
CAMARTEC
P.O. Box 764
Arusha
Tel: 255-051-112799 (Mr. Hebga, UCD)
Fax: 255-051-113272 (as above)

9. Uganda
Mr. G.R. Turyaikayo
Ministry of Natural Resources
P.O. Box 7270
Kampala
Tel: (256-41) 235889/257863
Fax: (256-41) 230220/235895

10. Zambia
Mr. S. Hibajene
Deputy Permanent Secretary
Ministry for Energy and Water Development
Lusaka
Tel: 2601-252011
Fax: 2601-252589

11. UNIDO
Mr. Ernest Allai
Industrial Development Officer
ECDC/TCDC Coordination Unit
Investment and Technology Promotion Division
United Nations Industrial Development Organization (UNIDO)
A1400 Vienna, Austria

12. Australia
Mr. Ken Butler
CASE
International Centre for Application
of Solar Energy
Level 8, 220 St. Georges Terrace
Perth, Western Australia 6000
Tel: 619-3217600
Fax: 619-3217497