

## **Annex 4**

### **Terms of Reference**

#### **Assessment of the Commercialisation of Selected Sustainable Energy Technologies, Products and Services**

##### **1. BACKGROUND**

The objective of the AREED programme is to expand and support the private sector in five select African countries (Botswana, Zambia, Mali, Senegal and Ghana) in the delivery of products and services in the sustainable energy field. Sustainable energy in this context is associated with the use of renewable energy technologies, energy efficiency measures and changing energy use patterns to reduce environmental impact and in particular reduce green house gas emissions. The term technology, as used here, includes both products and services.

AREED's approach to achieving its objective is through the provision seed or risk capital through loans or by taking shareholding in a company. Seed capital is the modest amount of capital needed to convert a good idea and a capable entrepreneur into a specific transaction that brings customers and improved energy services together. The provision of capital is backed up by financial and technical business development support and training.

For an entrepreneur or business plan to be supported by AREED it has to meet a number of criteria including the suitability of the technology employed for the type of business venture. Although choice of technology is not the dominant issue in making a business work – it comes far second to general business skills – it has a definite effect on business plan structure and viability. To date, business opportunities in the sustainable energy sector have been mostly aimed at selling electricity services through PV electrification, renewable energy fuelled independent power producers, or selling products such as solar water heaters, or PV panels.

In order to fully realise the potential for private sector participation in the energy sector a broader range of products and services should be brought into the loop. The initial AREED project identification round which took place in the five African countries generated a large number of potential business opportunities from local entrepreneurs covering a range of technologies. In order to evaluate the viability of these proposed or ongoing business ventures it is critical to understand the product or service, which is being offered. This will not only increase the range of possible businesses eligible for support, thus diversifying the AREED investment portfolio, but will also deepen the impact of sustainable energy products and services in the target countries

This need for a better understanding of the commercial applications and business structures is to be addressed by completing a number of small and focussed technology commercialisation assessments. These assessments will emphasise the commercialisation of the products or services by describing not so much the technology itself but the technology specific factors required for commercialisation. AREED's goal is to support businesses and not to develop technology.

On reading the technology assessments and in the context of the current group of target countries, AREED staff should be able to assess and judge the potential of a specific technology/ business concept in terms of its suitability for AREED investment as a viable and commercially sustainable business venture.

Visit [www.ared.org](http://www.ared.org) for more information on AREED.

##### **2. OBJECTIVE**

The activities covered by this terms of reference have the following objective:

Provide AREED with background information on the suitability of providing selected technologies, products and services in a commercially sustainable manner, in order to guide the screening and selection of investments and the development of business models.

### **3. SCOPE OF WORK**

The scope of work describes the framework under which the technologies will be researched. The implementation of the project will include, but is not restricted to, the activities identified below. The technologies that will be investigated are:

- Solar drying for agricultural products
- Solar(or other renewable energy) ice production/ refrigeration
- Carbon based fuel production from coal or biowastes to replace conventionally produced charcoal
- Solar cooking

The project will be completed through desk research, literature surveys as well as contact with relevant organisations and entrepreneurs involved or knowledgeable of the commercialisation of these technologies.

The time and budget available for the execution of the tasks are limited. This implies that the consultants contracted should be knowledgeable of the specific field and have most of the information readily available.

#### **Technology description**

Provide a technology description including where relevant the following aspects

- Develop a framework for describing the technology that takes into account regional differences in application
- Has the technology been commercially applied in Africa or elsewhere?
- Describe the commercialisation aspect of the technology, is it as a product itself or the production of products or services with commercial value. For example: is the business manufacturing solar crop dryers and/or is it buying solar dryers wholesale and acting as a retailer, or is the business selling produce that has been produced using a crop dryer.
- Describe the factors required for production or service delivery (fuel, capital, equipment, human resources)
- Who supplies the technology (local or global manufacturers)
- Are any warranties or guarantees available for the system or components?
- Can the technology be manufactured locally? All components or only some?
- Is there a dedicated source of financing available (e.g. through supplier?)
- Where relevant would this 'financier' be interested in entering the AREED countries
- Are there any non-production costs involved in accessing the technology (licence fees, patents)
- Describe the scale of the commercialisation on a individual business basis
- List any 'unique/killer' requirements for commercialisation including land use, input resources, market structure (Concessions/Permits) and technical support.
- What training is required for system use and maintenance?
- Where possible, provide an existing case study including typical business plan information and if possible outlines of a generic business model
- Provide a reference for technical commercial info as well as contact details for further reference.
- Provide any other relevant reference materials, which could eventually assist in further technology review/assessment.
- How would it be marketed?
- What are the key determinants of market potential

#### **Reporting**

≈ A report containing the results of the research as specified under Deliverables below.

### **4. DELIVERABLES**

The project will have the following deliverables to be submitted to the AREED stakeholders:

- A report containing the descriptions of the results.
- Additional technical material such as manufacturers brochures should be annexed where available.
- The main part of the report should be delivered in electronic (MS WORD) format as well as in hardcopies of the full report (including annexes that are not available in soft format).

## 5. ORGANISATION STRUCTURE AND RESPONSIBILITIES

<b>Organisation</b>	<b>Role/Responsibility</b>
External consultants	Completion of activities identified in the TOR
UCCEE	Inputs to research, Project management
UNEP DTIE	Inputs to research, Contract administration
E&Co	Inputs to research Comments on report
AREED regional representatives	Inputs to research Comments on report and fact sheets

## 6. DURATION OF ACTIVITIES

It is envisaged that the completion of each technology assessment will take 5-7 working days

## 7. TIMING

The timing of the project is as follows:

<b>Milestone</b>	<b>Date</b>
Acceptance of TOR by AREED	15 December
List of consultants identified by AREED	30 January
Contracting	15 February
Research completed	15 March
Draft report circulated for comments	15 March
Final report	31 March

## 8 COST

The cost of the activity will be based on quotes received from consultants

## **Biography**

Innovative Approaches to Agribusiness Development in Sub-Saharan Africa

Volume: 3 East Africa – Final report

Jim Maxwell Richard D. Abbott – Abt Associates - technical paper No. 80 – December 1997

Comparative Economic Advantage of Alternative Agricultural production Activities in Zambia

Oliver S. Saasa – Dennis Chiwele – Foustin Mwape – John C. Keyser

Institute of Economic and Social Research - University of Zambia

Technical paper No. 104 – December 1999

Publication services provided by the michell group, Inc. (TMG)

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Proceedings of the Workshop on Commercialisation and Transfer of Agricultural Technology in Africa –  
Accra , Ghana – November 4-7 – 1996

Editors: Bantayehu Gelaw - Consultant, Agricultural Technology development and transfer

Emmanuel Acquah – University of Maryland Eastern Shore

Charles Whyte – USAID/AFR/SD/PSGE

Technical paper No. 57 – July 1997

Building Successful Commercialisation Teams for federal Lab technologies

Prepared for the partners in technology Transfer - January 1998

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SD publication Series – Office of Sustainable development – Bureau of Africa

Endowments in Africa – A discussion of Issues for Using Alternative Funding Mechanisms to Support  
Agricultural and natural resources Management Programs

Technical Paper No. 24 – August 1996

Sustainable Banking with the poor – Microfinance Handbook

An Institutional and Finance perspective

Jonna Ledgerwood – The world bank

December 1998 – ISBN 0-8213- 4306-8

Sustainable energy News – News letter for INFORSE International Network for Sustainable Energy

No.30 August 2000 – ISSN 0908 – 4134

Mango Drying for Export Income / good export income with a good Solar Dryer

By Youssef Arfaoui - M.Sc. Mech. Eng. – FED –Denmark

Biomass Energy and coal in Africa

JBS Diphaha – P C Karenzi – D L Kgathi – R S Maya

Edited and introduced by Dohall and Y S Mao

Zed books Ltd – London and new Jersey

Energy for Rural Development

Edited and Introduced by M. R. Bhagavan & Stephen Karekezi

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Financing Renewable Energy Projects

A guide for Development Workers

Jenny Gregory, Semida Selveira, Anthony Derrick, Paul Cowley, Catherine Allinson, Oliver Paish

ISBN 1 85339 387 8

Survey on Solar Dryers for drying of food and wood in Ghana

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November 1999