

Energy for Poverty Alleviation in Sahel

Intelligent Energy Project

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Report of the First Regional Workshop of Intelligent Energy for Sahel - PART 1

From the 3rd to the 6th of October 2006 the first Workshop of the IE4Sahel has been held in Niamey, at the centre Agrhymet. The workshop involved around 36 participants from eight African countries and four European countries, representing government, electricity utilities, academia and research institutions. This report is a summary of the themes covered during the workshop:

- Sahel energy poverty situation
- Energy and poverty reduction strategies
- Low cost technologies
- Renewable energies mapping potential
- Sustainable energy buildings
- Needs assessment methodologies
- International, regional and national energy policies,
- Energy and the Millennium Development Goals
- Energy and gender
- Electricity reforms

this number of the newsletter reports the discussion held on the first two days of the Workshop.



Day 1 - Tuesday 3rd October 2006

The first day of the workshop was dedicated to the opening ceremony and to an introduction and discussion of the project, and the theme of energy in Sahel.

At the **opening ceremony**, **Mr. Faustin Gnoumou** from the department of Formation and Research, on behalf of the Director General of the Centre Agrhymet, opened the meeting and welcomed the participants.

Mr. Gnoumou, in his introductory speech, recalled the importance that energy has for the Centre Regional Aghrymeth and

the several projects developed in the last 25 years, the first of which was implemented by CILSS in 1981. This project looked at the adoption of improved cook-stoves, followed by the launch of the Solar regional program PRS in 1986. In 1988, CILSS created a network of professionals in domestic energy PESED and launched the regional program Gaz. In 2001, CILSS launched PREDAS, the regional program for the promotion of household and alternative energies in Sahel.

Mr. Jeremy Lester, EU senior official, stressed the importance of energy in combating poverty and the commitment of the European Union through various funding channels and cooperation initiatives.



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ves, to help developing countries find different solutions to fulfil the energy needs of the poor and achieve the Millennium Development Goals. Mr. Lester wished the participants a good and productive workshop, underlying the important role that policy dialogue, institutional and scientific capacity building might play.

After the opening ceremony, each participant briefly introduced him/herself and his/her institution. **Dr Luis Alves** from Instituto Superior Técnico, Portugal, introduced the project “Intelligent Energy for Sahel”, its objectives and results so far. Mr. Alves explained the project rationale, the importance both of research and cooperation activities, the value of networking between professionals working in the energy and poverty reduction sector in Sahel and the centrality of CILSS and Agrymeth. Mr. Alves also introduced the main workshop themes and the methodology of work, the collaboration with PREDAS (many participants are already involved as national focal points of the PREDAS programme) and the expected results. At the first round table, participants discussed many items with the IE4Sahel European staff.

Prof Albert Wright, from “Ecole des Mines et de la Géologie” (EMIG) Niger, during his presentation introduced many themes that would be discussed extensively in the following days. He first illustrated the energy challenges in Sahelian countries, and illustrated the main politics and conferences on energy he witnessed in the last three decades, starting from the 1978 Cairo UN Conference on Science and Technology for the Development, to the 1980 Lagos Plan and to the most recent ECOWAS initiatives. Prof. Wright expressed his concern about the fact that too many meetings and high speeches gave birth to very few results on the field. In particular, Prof Wright noted:

- the importance of developing and producing local technologies, the knowledge and all the political steps necessary to help the empowerment of Africans in the energy domain;
- the huge need for a long-term regional and global approach to energy, and for further cooperation and planning; and

- that too little time, energy, and money has been dedicated to human resource development which is urgently needed for the development of the region.

The debate between participants became very intense, especially on the strategies and policies to let African Countries diminish the gap with the developed world, learning from past failures.



Day 2 - Wednesday 4th October 2006

The second day of the workshop was dedicated to technical and scientific issues. **Dr. Luis Alves** presented an array of “low cost” technologies that could be easily developed locally and that could significantly widen access to energy services for the poor. Cost and ownership of technologies are two particularly important barriers that halt the diffusion of energy services in developing countries, diminishing the possibilities of economic development and the effectiveness of poverty reduction strategies. The technologies presented by Dr. Luis Alves were characterised by simplicity, easy access and low maintenance cost, and the capacity of improving the quality of life of adopting communities. Between them, we can recall various solutions of distributed generation, Mini and Pico hydro can be built with low cost equipment already widely available (like water pumps), wind mill for water pumping or electricity production can also be built and run at very low cost and re-using materials and technology already available. Biomass is by far, the most used primary energy source in Sahelian

countries, but in the majority of cases, biomass is used in traditional and inefficient ways, with severe impacts on both the environment and consumers. Improved and modern biomass can, on the other hand, really improve efficiency, safety and access to energy. Improved biomass is all about improved cooking/heating stoves and improved bio fuel kilns, while modern biomass is about conversion of biomass energy to advanced fuels/forms namely liquid fuels, gas and electricity. Modern Biomass technologies, easily applicable in developing and Sahelian countries, include biogas systems, modern use of agricultural residues (briquetting), jatropha oil biodiesel and others. Another area where important reductions of costs can be achieved is distribution technologies. For example, through the use of SWER (Single Wire Earth Return) the costs of distribution can be cut in half, and the provision of community lighting through high-mast flood lighting can be both effective and more economical with respect to other solutions. Often technologies developed in subtropical, rich countries are not appropriate in an environment with different, culture, resources and climate. This is why, especially in areas where poverty is predominant, using simple, low cost, locally owned technologies, and inventing new ones on the basis of local needs and local available resources, can significantly increase the access to energy services and thus, the quality of life. Debate and discussion concentrated on the availability and diffusion of different technologies in the countries, the importance of photovoltaics, its environmental and cost problems (batteries and costs of panels), as well as other solutions aimed

at lowering the costs, e.g. standardization of electric boards, energy savings and energy efficiency technologies.

Mrs Daphne Mavrogiorgos, of the **Centre for Renewable Energy Sources (CRES)** introduced the theme of assessing the potential of renewable energy sources. Firstly, the methodology was presented to document the RES-related findings and assess the potential for new renewable energy (RES) projects for any given region, along with the parameters affecting RES exploitation and prospects for new RES investments. Next, the two main steps were analysed (Step 1: Survey of current situation and Step 2: Analysis of RES Potential & investigation of alternative development scenarios with maps presented as examples). Then the Geographic Information System (GIS)-based Tool for the assessment of the technically and economically exploitable RES potential was presented. The tool's aim, innovations, system inputs, results and information, along with maps and screen examples of how the tool functions, were analysed. Both the methodology and the tool are based on: a) The assessment of the technical and economical potential of RES in Greece (National Operational Programme for Energy - www.cres.gr/kape/datainfomaps.htm), and b) A Planning Tool for the Optimal Regional Integration of Renewable Energy Sources (Opti-RES Altener Contract No. 4.1030/Z/01-089/2001 - www.optires.info). Two previous projects carried out by CRES. Training material was distributed after the presentations and its content discussed.

Prof. Manuel Correia Guedes, Director of the **Architectural Research Centre of the Instituto Superior Técnico (IST)**, presented on the subject of sustainable architecture and urban planning. A general overview on the issue was first presented, underlining the importance of this area as a major contributor to the reduction of energy consumption and consequent environmental impact, such as the CO₂ emissions responsible for global warming.

Various energy-saving (passive) design strategies were presented, focusing on the particular context of developing countries. Issues such as self-building, the revision of conventional comfort standards, and the need to reduce the use of conventional energy (fossil fuels) by mechanical systems



in buildings – in particular air conditioning, were discussed. Traditional building techniques were analysed and pointed out as positive examples of adaptation to the climatic context, constituting a good reference for energy efficient design – which may be further improved with modern (low tech) technologies, reducing energy consumption and simultaneously provide comfortable environments.

Several successful case studies were presented, including considerations on the use of low-energy active systems, mixed-mode systems and renewable energy systems such as solar thermal, solar HVAC, or photovoltaics.

Mrs Hannah Routh, Energy for Sustainable Development Ltd (ESD), made a presentation on **the methodologies used to identify energy needs in rural areas**.

This presentation began with a description of the various rural appraisal techniques that have been developed by DFID (Department for International Development). The 'Rapid Rural Appraisal' and 'Participatory Rural Appraisal' techniques were compared and contrasted, and the benefits of the Sustainable Livelihoods were described. The application of the Sustainable Livelihoods approach for assessing the suitability of energy projects was then described, by means of a case study, namely the Mpeketoni Electricity Project in Kenya. For this project, a Sustainable Livelihoods assessment was carried out, to assist with the planning and design of the project. A survey was administered to 97 households and 113 businesses in the area, and the data collected was used not only at project inception but also in current plans for an extension. More interestingly, the survey found that the population was prepared to

pay higher than the prevailing national rate for electricity, as the 'value added' through commercial productive use is considerable. The community pays US\$ 0.36/ kWh, compared to an average national tariff of US\$ 0.09/kWh.

The next section of the presentation focused on the project cycle, and common success criteria for electrification projects. There are numerous examples of successful implementation where the electrification is focussed on productive uses (e.g. manufacturing, commercial enterprises, shops and bars) and essential services (e.g. schools, hospitals, communication). Many examples of this from elsewhere in Africa were described, including in Ethiopia, Kenya and Uganda.

Finally, the group split into four workshops to discuss:

- The priorities for energy and electrification in the countries of the Sahel
- Social, institutional, technical and other barriers to successful implementation
- The importance of actions at the local, national and regional levels.



Project Schedule

The project is scheduled to be developed until mid-2007, with the realisation of two main Workshops, from where the project team already ask for interested parties to mark in your agenda.

1st Workshop - October 2006 – Niger

2nd Workshop - March 2007

Besides these two Workshops the project is also committed to involved institutions to build a permanent network between the professionals

Istituto Superior Tecnico RGESD - IST Portugal	ESD - Energy for Sustainable Development Ltd UK	CRES - Center for Renewable Energy Sources. Greece	ARC - AGHRYMET Center Niger
Long experienced research team in the field of energy planning and renewable energy systems.	Consultant firm with experience in energy policy and regulation.	The Greek national centre for Renewable Energy Sources, Rational Use of Energy and Energy Saving.	Specialised institution committed with the food security and to help the management of natural resources in the CILSS region..

The Project Team

How to contact the Project Team

to have up to date information on the project visit our website - <http://ie4sahel.energyprojects.net>

to contact the staff, receive the newsletter, contribute with papers or for informations and comments ie4sahel@energyprojects.net

Or use the following form

Family Name.....First Name.....
 Profession.....Company-Institute.....
 Postal address.....Postal code.....City.....Country.....
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☐ I am interested in the IE4 Sahel project. Send me an invitation for public meetings about IE4 Sahel.

☐ Please add only my name to the mailing list and send me more information about IE4 Sahel

Send to ARC – AGRHYMET Regional Centre P.O.Box 11011 - Niamey – Niger Fax: + 227 73 29 78 or to
 IST – RGESD - Mch. Dep. - Pv. de Mecânica I, 2º Andar Inst. Sup. Técnico - Avenida Rovisco Pais 1049-001 - Lisboa –
 PT Fax: +351 - 21 847 5545