**PREA Promoting Renewable Energies in Africa**

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**SUMMARY**

PREA is a joint project between four European Universities and three African Universities as well as the International Solar Energy Society (ISES), an international NGO, that promotes renewable energy. The aim of PREA is to reduce poverty by influencing energy policy and regulations in Africa, through training and capacity-building of energy professionals, regulators, academics as well as policy- and decision-makers to enhance their skills in implementing Renewable Energy Technologies (RETs) and Energy Efficiency (EE) in buildings in Africa starting with three countries, namely South Africa, Tanzania and Uganda. Training will be offered through Workshops and a Masters Degree Course in Integration of Renewable Energy in Buildings (IREB), both made to suit local requirements in climate, economic and cultural conditions and allowing for exchange and further training opportunities.

**INTRODUCTION**

Africa is the only continent on this planet that sits squarely on the equator and where both the tropics of Cancer and Capricorn pass through its land mass. Thus Africa is mostly tropical but local microclimate in various parts it are modified by other factors such as relief and proximity to natural features such as mountain ranges and big water masses. Africa boasts of different forms of natural vegetation raging from dense tropical rain forests through grasslands to scrubland and deserts. The biggest desert in Africa is the Sahara. All these features give Africa a unique position in potential on the world renewable energy map. It has 95% of the world’s best sunshine and a huge potential of hydro, wind, bio and geothermal energies.

However, despite the fact that on one hand the African continent is endowed with vast resources of renewable energies (RE), but on the other hand, the energy situation in most African countries is desperate.

For example in Uganda and Tanzania only 10% of the total population has access to electricity at all, the main energy source is biomass, usually in the form of firewood, or charcoal. For the few urban and very few rural areas that are connected to electricity grid, supply failure resulting in blackouts and brownouts is a frequent and increasingly regular phenomenon.

There is, therefore, an urgent need to address RE and energy efficiency (EE) in order to improve the energy situation in an environmentally friendly and sustainable way.
One starting point to implementing RE and EE strategies in Africa is to focus on energy use in buildings, as the built environment contributes significantly to energy waste and pollution.

**AFRICAN - EUROPEAN PARTNERSHIP**

PREA is a joint project between four European Universities (London Metropolitan University, UK; University of La Rochelle, France; National and Kapodestrian University of Athens, Greece; University of Dortmund) and three African Universities (University of Dar es Salaam in Tanzania, Uganda Martyrs University in Uganda, Witwatersrand University in South Africa), as well as the International Solar Energy Society (ISES), an international NGO, that promotes renewable energy. It aims at a joint development and implementation of coordinated Masters’ degree courses in this field that initializes the formation of a network of Southern African Higher Learning Institutions and links them with an already existing European network (TAREB) in which Dortmund University already participates together with six other European Higher Learning Institutions, three of which are also named above as participating in the PREA project. The Masters’ courses are to be preceded by, and later to run parallel with a series of Workshops, in order to sensitize African government policy makers, decision makers and implementers, regulatory agencies and senior members of academic institutions about energy efficiency (EE) and application of renewable energy technologies (RETs) in buildings, as a way of fighting poverty and saving the environment at the same time.

This project is intended to run for three years during which time it is expected to have established permanent structures in form of Masters’ courses at the three African universities, which are intended to continue even after expiry of the project period.

**WORKSHOPS**

Together with establishment of Masters’ courses at each of the three African universities, organization of sensitization Workshops is one of the major activities in the PREA project. Three Workshops have so far already been conducted in the three African countries, namely South Africa, Tanzania and Uganda. They were all conducted in October 2006 with short intervals in between. All workshops had a common title, “Sustainable and Energy efficient Building in Africa” but were further differently subtitled to reflect areas of local focus which are slightly different from country to country among the three participating African countries.

The Workshop in South Africa took place at the Midrand near Johannesburg on 3-4 October 2006. Its subtitle was “DMEs Energy Efficiency and Renewable Energy Targets: Addressing South Africa’s Energy Crisis through Built Environment Interventions”, where DME stands for Department of Minerals and Energy. The particular local situation in South Africa addressed at this Workshop was the fact that the country did not produce enough electricity to meet the growing demand, giving rise to what is locally termed as an “energy crisis”. That is why this phrase was used in the Workshop subtitle. The workshop which was supported by the Development Bank of South Africa (DBSA) was attended by 150 participants.

The Workshop in Tanzania, subtitled “Addressing Tanzania’s Energy Crisis through Design and Settlement Development” was organized at the Landmark Hotel in Dar es
Salaam on 10-11 October 2006. It was attended by 32 official participants from various
government offices and professional organizations and individual professionals. In addition
10 students also attended the Workshop where 16 papers were presented 6 of which were
from project partners and 10 from other attendees.

In Uganda, the workshop was subtitled “Promoting Sustainable & Energy Efficient Urban
& Building Design practices in Uganda”. It was organized on 13-14 October 2006 at the
Hotel Africana in Kampala and was attended by 35 participants who included government
officials mostly policy and decision makers, professionals including Engineers and Architects,
university academic staff members and some students. Eleven papers were presented, of
which six came from project partners and five were presented by government officials and
professionals. The Ugandan Ministry of Energy and Uganda society of Architects were also
represented and their papers were presented.

The critical situation of electricity supply and the need for new and sustainable energy
resources has been underlined by the long almost daily power cuts, especially in Tanzania and
Uganda in the last few years. Coincidentally, as if to underline the fact for the Workshoppers,
long duration power failures occurred during the course of the events in both Tanzania and
Uganda. Water shortages in Dar es Salaam were also indicative of this power problem.

As a form of side activities, some exhibitions served at these workshops made by
manufacturers of sustainable energy and building products as well as service providers in the
sustainable buildings industry, such as sales representatives and installers of renewable energy
products, e.g. PV modules, Solar water heaters etc. One of the other highlights of the
Workshops is that they served to bring together all parties involved and interested in
sustainable energy activities such as businesses and respective departments and individuals in
local academic institutions. Certificates were issued to Workshop participants. These
certificates had some extra value because in some cases such as Uganda and South Africa
they could be used to gain some professional development points which is a requirement of
some professional bodies from their members in those countries.

Another series of workshops is scheduled for later this year (September/October 2007), after
which a project meeting will be organized in Uganda to evaluate the milestones reached in the
implementation of the project and to assess its impact(s).

MASTERS DEGREE COURSES

Masters courses are to be introduced at the three African Universities in the PREA project for
capacity building in education and training and to promote sustainability concepts in the
design, construction and occupancy of buildings. The long term target is to train
academicians for more research and further propagation of these ideas and concepts in
subsequent courses even after the end of the project’s scheduled time of three years. The aim
is to eventually spread these ideas and concepts throughout the entire continent, by
cooperation of the three African Universities and by networking with other African
institutions engaged in this area.

The masters courses are supposed to use the expertise gained on a similar project in Europe
called TAREB (Teaching about Renewable Energy in Buildings) but will be tailored to suit
the local environment and to reflect specific demands of the country in which they are offered.
and taught as well as the technologies that can be easily made available there. The Masters programs will generally have some compulsory core modules and optional specialist modules some of which will be tailored to reflect local demands.

At Uganda Martyrs University, the Masters’ course is planned to be introduced in phases step by step. According to Mark Olweny, the assistant Dean of Faculty of Building and Technology, who is also the local PREA project coordinator there, the project would be phased in, in two steps starting with a Graduate Diploma in Environmental Design to run either as a one year full-time course or as a two year part-time course. The part-time program, 50% of which can be taken in form of off-campus modules, is to be aimed at applicants possessing the equivalent of the basic three-year undergraduate program currently run by the same University as Bachelor of Science in Building Design and Technology (B.Sc, BDT). The second phase will be the actual Masters program will be called Master of Environmental Design (M.Sc. ED). It will consist of specialist modules and will be aimed at professionals who have either completed the full five years Bachelor of Architecture course or have upgraded their basic three year course with the Graduate Diploma. Some people with other professional qualifications e.g. in Engineering, Urban Design or Quantity Surveying will also be eligible to apply directly for the one year full-time Masters. Basic concepts in environmental design, will already have been introduced at undergraduate level, will develop students’ interest in this area and serve as a “catchment area” for students and professionals.

The new Masters course at Witwatersrand University (WITS) will aim at both students and professionals. According to plans already under way at WITS, the Masters course will be associated with four separate postgraduate activities namely organization of short open certificate courses and modules in collaboration with other institutions such as Stellenbosch University, establishing new “Continuing Professional Development” (CPD) courses for established professionals, incorporation of Energy Efficiency and Renewable Energy research into existing Masters and PhD work by research and thesis, as well as introduction of taught modules into Bachelor of Architectural Sciences (BAS(HONS)). There will be two masters versions namely the Professional Masters of Architecture (M.ARCH(PROF)) and the Master of Architecture specializing in Housing (M.ARCH(HOUS)). As an unexpected opportunity the PREA project coordinator at WITS, Daniel Irurah, was requested to develop a teaching module on Renewable Energy, in the process of establishing of a new Master of Philosophy (M.Phil) on Renewable Energy due to start at Stellenbosch University later this year (July 2007). PREA has been identified as one of the key strengths of WITS in its collaboration efforts with other institutions in South Africa.

Dar es Salaam University is also quite ready to establish the new Master course. It has all the necessary manpower and teaching facilities for the course to be able to take off this year. Existing departments which are ready to collaborate in establishing the new Masters course include the Department of Architecture in the Faculty of Architecture and Planning (FAP), the Faculty of Civil Engineering and the Built Environment, the Department of Energy in the Faculty of Mechanical Engineering and Chemical Engineering and the Department of Electrical Power in the Faculty of Electrical Engineering and Information Technology.

RESULTS / DISCUSSION

Although only one year of the three-year-project has passed there could be improved already a few things in Africa that would not have happened without PREA:
Three universities in sub-Saharan Africa have decided to implement masters courses in the area of renewable energies energy and efficient building during the project duration. Three workshops about sustainable energy supply and about low cost and high comfort buildings have been carried out with active participation of key actors from the three African countries. The network of African institutions working in the areas of energy and building could be improved, last not least by the website www.ises.org/PREA.

Thus the PREA Project has already proved to be an important event in the development of energy consciousness in Africa. Both the Workshops and master courses are developing satisfactorily. Inference from the so far already conducted Workshops is very good. From responses to questionnaires given to both participants and organizers it is indicated that people concerned are very satisfied with the stages and milestones that have been reached so far. Project websites (shown hereunder) have been established. Workshop handbooks with all the papers presented at Workshops have been published and distributed to workshop participants and other interested parties, a CD summarizing all activities has been developed and as requested by the European Commission, a PowerPoint presentation containing “publishable summary slides” has been produced and updated. The most important fact however is that through this PREA project, the issue of energy efficiency and renewable energy in buildings in Africa has obtained a forum through which it will be more specifically and efficiently addressed within an integrated building design and construction approach. Moreover, African universities have had a unique opportunity at South–South collaboration among each other and South-North collaboration with their European counterparts.

CONCLUSIONS

The PREA project, although scheduled to run for three years, is meant to have a long lasting impact in the development of a new energy consciousness in Africa. It has started with the Workshops that are aimed at sensitizing African governments’ officials, policy makers, decision makers and implementers as well as regulatory agencies about the importance of energy efficiency and application of renewable energy technologies in buildings as a way of fighting poverty and at the same time preserving the environment for posterity. In short the PREA project is a catalyst for sustainable development and poverty eradication in Africa. It will help Africa achieve some of the millennium development goals sooner rather than later. In the first project year it has become evident that there is interest in capacity building in postgraduate university education and a strong demand for it. The implementation of the masters courses at the three African universities has started a sustainable development.

ACKNOWLEDGEMENT

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REFERENCES

Websites:
Some websites associated with the PREA projects have been established by ISES and some of the other project participant universities. Some aspects of PREA have also been published by other independent publishers as well. Following hereunder is a short list of websites and online publications about PREA.

http://cms.ises.org/index.xsp

http://www.ises.org/PREA

http://hermes.wits.ac.za/www/Conferences/PREA-WITS

http://grbes.phys.uoa.gr/prea/index.htm

http://www.univ-lr.fr/poles/sciences/formations/gc/master_afrique.html


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