



Network of
Energy Excellence
for Development

NEED Newsletter 02-2015



HIGHLIGHTS INSIDE

• NEED Kick-Off Meeting

The official opening of the NEED project took place in Lusaka, Zambia, from 13th to 16th April 2014. Besides the get-together and the development of mutual knowledge, the focus of the meeting was on the consolidation of responsibilities and the preparation of the schedule of activities.

• Conference on Solar Energy Technology in Developing Countries

On 6th and 7th November 2014 members of the NEED team joined the Energy Technology in Development Cooperation Conference. About 100 experts for development cooperation and solar specialists from 25 different countries met to discuss the opportunities and challenges of solar energy use in southern countries.

• The NEED partner organisations in brief

• First NEED Project Meeting in Ingolstadt

THE PROJECT IN BRIEF...

NEED means

**Network of Energy Excellence
for Development**

and therewith describes already the central idea of the project: The establishment of a research network in the field of Renewable Energies in Southern Africa. Four universities and one research centre from Zambia, Namibia, Botswana and Germany have joined their forces to create structures for the development of technical know-how in the field of renewable energies, to interlink relevant

stakeholders and to foster the awareness and the willingness to take actions for renewable energies on political level in the target countries.

Of central importance therefore are the following three fields of action

- the development of dual study programmes
- the harmonization of industry standards and
- the pooling of research activities in the field of renewable energies

Besides these three fields of activities two energy concepts for remote areas – a dryland area

and a wetland region – will be conceptualised.

The NEED project wants to interlink successful initiatives, research institutions, small- and medium-sized enterprises (SMEs) and national and local public decision makers in the domain of Renewable Energy Technologies (RETs) in order to contribute to a wider acceptance and application of renewable energies within Southern African societies.

The project is scheduled for three years and funded by the European Union.

IMPRESSIONS OF THE NEED KICK-OFF MEETING IN LUSAKA

From 13th to 16th April 2014 the official NEED Kick-Off Meeting took place in Lusaka, Zambia.

Besides the get-together and the development of mutual knowledge, the focus of the meeting was on the consolidation of responsibilities and the preparation of the schedule of activities. Financial matters were outlined by the project coordinator and procedures in terms of content related activities discussed.

Furthermore, a first network meeting with associate partners and interested institutions from Zambia took place. The project leader, Prof

Wilfried Zörner from THI, presented the NEED project to the audience. Afterwards the participants discussed together various topics related to renewable energy and the project content, e.g. about research strategies in the field of renewable energies, industry standards and off-grid systems. This part of the meeting also created a test bed for ideas which the project intends to pursue as the objectives of the project.

Another part of the meeting was a tour around the UNZA campus and an excursion to two renewable energy facilities in the outskirts of Lusaka:

Thomro Farms for Biofuels and Pumulani Renewable Energy Training Centre. These facilities are involved in the development and training of renewable energy technologies in Zambia.

The meeting was regarded as a great success by all partners involved, and the associate partners particularly called for a continued interaction even beyond the meeting.



Official Opening of the NEED Kick-Off Meeting through the Vice Chancellor of UNZA, Prof Stephen Simukanga (6th from the right) and the project leader Wilfried Zörner from THI (5th from the left) [Source: UNZA]



Vist at the Thomro Farms for Biofuels with Prof Thomson Sinkala [Source: THI]



Fruitful Discussion with associate partners and external institutions [Source: THI]

THE NEED PROJECT AT THE CONFERENCE ON SOLAR ENERGY TECHNOLOGY IN DEVELOPMENT COOPERATION IN FRANKFURT, GERMANY

On 6th and 7th November 2014 the Solar Energy Technology in Development Cooperation Conference organised by OTTI took place in Frankfurt, Germany. About 100 experts for development cooperation and solar specialists from 25 different countries met to discuss the opportunities and challenges of solar energy use in southern countries. The conference was a showcase for real-life examples and lessons learned from several implementation projects.

The NEED Project Leader Prof Wilfried Zörner and the NEED Energy Expert Ms Marie Hüneke from Technische Hochschule Ingolstadt (THI), attended the conference to represent the NEED project and spread information about the NEED network. In addition they presented a simulation model for solar thermosyphon systems that was developed by THI. With the model the detailed simulation of solar thermosyphon systems in Southern Africa becomes possible. Thus, such systems can be easily adapted to the local conditions and their performance optimized. The lack of experience in system design, sizing and composition can therefore be addressed in advance to prevent the installation of malfunctioning or oversized systems.

Another member of the NEED project team that

was present was Ms Helvi Iлека, Researcher of the Renewable Energy and Energy Efficiency Institute of the Polytechnic of Namibia. She gave an example of a promising case study on the successful implementation of solar water heaters in Namibia. Through the solar water heating plan for Namibia the capacity of the heaters was increased almost tenfold between 2005 and 2008. 'The more than 100,000 electric geysers in households are responsible for the peak in Namibia's electricity demand,' explained Helvi Iлека. As a result, utility NamPower plans to replace 20,000 geysers with solar water heaters as a demand-side measure.

'We had an interesting mix of participants and excellent networking opportunities,' stated Mr Joscha Rosenbusch, member of the scientific committee and International Development Consultant at the BSW Solar. 'Especially encouraging was the high number of specialists from Africa, one of the key future markets for solar technology.'

Also the presentation on the NEED project that was given by Prof Wilfried Zörner received a very positive feedback. He emphasized the importance of capacity building in the field of renewable energies in Southern Africa and

explained the focus of the NEED project. He concluded: 'A lot of participants showed their interest in the complex themes of the project. We had a lot of serious discussions on interesting aspects that we are happy to consider in the future activities of the NEED project. All in all the conference can be seen as a great success for the NEED project and as a first step to spread and expand the NEED network.'



Dr. Tania Rödiger-Vorwerk, Deputy Director General, German Federal Ministry for Economic Cooperation and Development, opening speech, OTTI-Conference Solar Energy Technology in Development Cooperation [Source: Press Release Otti]

THE NEED PROJECT AT THE ZAMBIA INTERNATIONAL ENERGY CONFERENCE

The Policy Expert from Work Package 2, Dr Ackim Zulu, attended the Zambia International Energy Conference on behalf of the School of Engineering. The conference ran for three days, from 25th to 27th November 2014 and was hosted by the Ministry of Mines, Energy and Water Development (MMEWD) together with Stanbic Bank Zambia, the Energy Regulation Board (ERB) and the Rural Electrification Authority (REA). The theme of the conference was Power and Renewable Energy: Unlocking Zambia's Investment and Growth Potential - 50 Years.

The prime objective of the conference was to establish avenues of unlocking the energy sector for investment by addressing investment and financial challenges that were being faced in the implementation of energy projects. In addition, the conference was supposed to provide a platform for increasing interaction among stakeholders in the Energy Sector and disseminating information on Government policy as well as showcasing potential and on-going projects.

On the first day, the Deputy Minister of MMEWD officially opened the conference and gave his keynote speech. This was followed by presentations of officials from MMEWD, ERB and Stanbic Bank. The main issues that were addressed concerning renewable energy

development in Zambia included: (a) the expected completion date of the Renewable Energy Feed-in-tariff (REFIT) policy that is currently being developed by Government (b) status on the Grid Code adoption (c) status on the adoption of cost reflective tariffs and (d) licensing of renewable energy technologies.

It was explained that: (a) the MMEWD under the consultancy of United States Agency for International Development (USAid) was developing the REFIT policy which was expected to be completed by mid-2015 (b) the Grid Code was adopted in 2013 (c) the cost reflective tariffs had not yet been adopted; as it was still under review by ERB and (d) for the Renewable Energy sector, ERB uses a "Light Handed Approach" i.e. less stringent application of license conditions (but does not compromise on safety & environment).

On the second and third day of the conference, representatives from different Renewable Energy related organisations presented on the services they offer and challenges faced in providing energy. Prospective energy companies, both local and international expressed interest in investing in RETs in Zambia as there was good market. However, they were reluctant to start due to the current low electricity tariffs. They advised Government and different stakeholders to quickly adopt the cost-reflective tariffs in order

to encourage the use RETs.

Links with potential stakeholders and target groups for the NEED project were created during the conference. Further, energy vendors and shops were identified and their contact details were obtained. In summary, vital information to meet some of objectives of Work Package 2 was collected.



Participants of the Zambia International Energy Conference on 26th November 2014 [Source: ZIEC]

NEWS

TECHNISCHE HOCHSCHULE INGOLSTADT

Introduction of THI

Technische Hochschule Ingolstadt (THI) was founded in the heart of Southern Germany as a University of Applied Sciences in 1994. Currently more than 5,500 students are studying at THI in 39 technical and economic courses at three faculties, supervised by 130 professors. Besides automotive engineering, energy engineering and especially renewable energies are the main pillars of the Faculty of Mechanical Engineering.

For many years, THI has successfully supported and developed dual study programmes in close cooperation with industrial partners. The dual study model is the optimum twofold combination of theory and practice. The joint study combines regular Bachelor's studies with vocational training. Currently, THI provides the largest number of dual students of all Bavarian universities.

The Role of THI in the NEED Project

The NEED project is based in the Institute of new Energy Systems (InES). The two main purposes of InES are practice-oriented student education as well as applied research projects in the field of renewable energies. The NEED Project Leader, Prof Wilfried Zörner, is professor at the Faculty of Mechanical Engineering and head of InES. He is not only the founding father of InES but also of the Bachelor's degree course 'Renewable Energy Technologies' and he is respon-

sible for intensifying the academic cooperation with African institutions.

InES is the Project Coordinator of NEED. It offers support in terms of technology and project management, takes care of the NEED network itself and ensures knowledge transfer to and between the project partners and local stakeholders. Also the dissemination activities are managed by THI.



Buildings of the Technische Hochschule Ingolstadt [Source: THI]



Technische Hochschule
Ingolstadt

Institute of
new Energy Systems

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BOTSWANA INTERNATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

Introduction of BIUST

The Botswana International University of Science & Technology (BIUST) was established by the Botswana Government to spearhead the drive to transform Botswana's resource-based economy into a knowledge-based economy through training, research and innovations in the fields of science, engineering, and technology. Located 275 km North-East of the capital, Gaborone, BIUST is developing infrastructure on a 2500-hectares piece of land



Botswana – Industry Standards

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in Palapye, a village which is gradually growing into a university town. BIUST's vision is to be a centre of excellence in science and technology education and research. Three colleges comprise the University, viz, the College of Engineering & Technology, the College of Information & Communications Technology, and the College of Science. All three Colleges offer undergraduate and postgraduate degree programmes.

BIUST admitted the first cohort of students in August 2012 and now has approximately 1,500 undergraduate and postgraduate students. The University is building a wide network of collaborations and partnerships locally and internationally in order to achieve its mission within the shortest possible time. One such partnership is embodied in the Network of Energy Excellence for Development (NEED) project.

The Role of BIUST in the NEED Project

BIUST is coordinating Work Package 4 (WP4) which is studying and assessing existing national and regional RET standards with a view to develop a standardization framework for RETs in the region in relation to international standards. The study seeks to establish the key renewable energy technology (RET) sectors in

the region, the corresponding industry standards, the advantages of harmonizing such standards across the region and ultimately develop a RET standardization framework. This will also involve determination of key RET players/stakeholders in the industry (public and private) with a view to engaging them in the development of a robust standardization framework for the identified RETs which it is hoped would enhance overall adoption of RETs and boost electric power availability through exploitation of clean energy in the region. The Dean College of Engineering & Technology, Professor James Katende, is the leader of Work Package 4, while the Head of Mechanical & Energy Engineering Department, Professor Tunde Oladiran, is the Energy Expert.



The Botswana International University of Science and Technology [Source: BIUST]

THE NEED PROJECT PARTNERS

OKAVANGO RESEARCH INSTITUTE

Introduction of ORI

The Okavango Research Institute (ORI) was established in 1985 as an institute for the study and conservation of one of the world's largest and most intact inland wetland ecosystems - the Okavango Delta - as well as other Southern African wetlands, river basins, watersheds and surrounding dry lands. ORI's vision is to be a leading wetland research institute. Academic programmes offered at ORI include the following:

- MPhil/PhD Programme in Natural Resource Management
- A6 credit undergraduate course on research methods otherwise known as winter course: Introduction to Wetland Research
- Regional master degree programme in integrated water resource management



The Okavango Research Institute [Source: ORI]

The Role of ORI in the NEED Project

In this project, Okavango Research Institute is responsible for Work Package 5 which is responsible for the development of a model to be known as 'Fossil-Free Wetlands'. This model seeks to make the Okavango Delta free from fossil fuels and focus on the use of renewable energy technologies. As such, ORI will develop a regional energy concept for the wetlands area of the Okavango Delta in Botswana. Along with the development of a roadmap for regional transition. This model should be turned into best practice examples for appropriate energy production and consumption, taking into account the related socio-cultural situation of the region.

Work Package 5 (WP5) leader is Professor Joseph E. Mbaiwa. He received his Ph.D. in Park, Recreation & Tourism Sciences from Texas A&M University, United States in 2008. He pursued his M.Sc. in Environmental Science and BA in Environmental Science at the University of Botswana. His research focus is tourism development, biodiversity conservation and rural livelihoods. In this project, his goal is to see the development of tourism development in the Okavango Delta that uses RET instead of fossil fuels. The conservation of the Okavango Delta also requires the use of RET which are environmental friendly.

Presently, WP5 has managed to collect secondary data on the types of energy sources and amount of energy used in the Okavango Delta. The Work Package has further developed a questionnaire to obtain primary data on the type and amount of energy used in the delta as per lodge/hotel. The Work Package is also working in the production of a manuscript on energy development in the Okavango Delta based on secondary data sources.



Botswana – Fossil-Free Wetlands

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UNIVERSITY OF ZAMBIA

Introduction of UNZA

The University of Zambia (UNZA) was founded in 1966, then with only 312 students in three schools. It now has nine schools, five directorates, dealing with over 16,000 students who are served by about 600 academic members of staff both at undergraduate and postgraduate levels.

The NEED project is managed in the School of Engineering (SoE), which is one of the old schools of UNZA established in 1972 with five departments. Over the years the SoE has graduated over 4000 undergraduate students. It has 17 Masters degree level programmes, in addition to PhD programmes in each department.



The University of Zambia [Source: UNZA]

The SoE has specific undergraduate courses which relate directly to renewable energy engineering, particularly in Agricultural, Electrical and Electronics and Mechanical Engineering. The SoE also boasts a Master of Engineering programme in Renewable Energy Engineering at graduate level

The Role of UNZA in the NEED Project

The NEED project at UNZA is led by Prof Mundia Muya, who is the Dean of SoE, while coordination is done by Dr Ackim Zulu, the Head of Department of Electrical and Electronic Engineering.

UNZA's role in the NEED project is to lead the development of 'Research Strategies' (WP2). The aim of this task is to accelerate research in Renewable Energy Technologies (RET) which is appropriate to endogenous energy resources. Research strategies are prepared in cooperation with relevant stakeholders and shall be anchored in national research policies, so that in future, newer and innovative projects on RET will be rolled out. At this stage in the project, the status and the needs of the RET research in Southern Africa have now been well understood.



Biomass Project of the University of Zambia [Source: UNZA]



Zambia – Research Strategies

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THE NEED PROJECT PARTNERS

POLYTECHNIC OF NAMIBIA

Introduction of PoN

The Polytechnic is a dynamic and fast growing institution with a strong focus on science, engineering, technology and mathematics. The Polytechnic emphasizes on innovation and strives to improve the living conditions of people through the pursuit of applied and problem-solving research. The Polytechnic was established in 1996 by an act of the Namibian Parliament to offer career oriented programmes to meet the scarce skills challenging the country. It currently has about 13,000 students enrolled in six schools (faculties). It is worth to note that 55% of the students are female. In December 2012, the Cabinet of the Republic of Namibia approved the long-standing request for a name change to Namibia University of Science and Technology. Hence, the institution is in change process which will be finalised sometime this year (2015).

The NEED project is housed in the School of Engineering. The school's strategic focus areas are: excellence in teaching and learning, student centeredness and building strong national and international collaborations. The School plays a critical role as the key driver of innovation, especially within the context of the imminent name change. It has three master programmes with planned doctoral (PhD) programmes as from this year.



The Polytechnic of Namibia [Source: PoN]

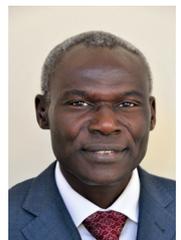
The Role of PoN in the NEED Project

PoN has a double role in the NEED Project. It is responsible for the activities of Work Packages 3 and 6 (WP3/6). Both Work Packages are led by Dr Samuel John, the Dean of the School. Coordination of the activities for WP3 and WP6 are done by Mr Andrew Zulu and Dr Paul Chisale respectively. The role of PoN in WP3 is to lead strengthening of Science, Technology and Innovation (STI) capacity in Renewable Energy Technologies (RET) in the Southern African region; to create an institution framework for science and technology in RETs; and to enhance practical education in RETs.

The role of PoN in WP6 is to collect and evaluate energy consumption and production data for the Gobabeb mini-grid and use this data to develop a regional energy concept; and develop roadmaps for regional transition. The later will also lead the initiation and institutionalization of transitional processes with the government and other stakeholders.



**POLYTECHNIC
OF NAMIBIA**



Namibia – Dual Studies / Renewable Mini-Grid Drylands

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IMPRESSIONS OF THE FIRST NEED PROJECT MEETING IN INGOLSTADT

From 14th to 16th October the first NEED Project Meeting took place in Ingolstadt, Germany.

During the visit at Technische Hochschule Ingolstadt, the participants discussed the project progress up to date and the upcoming tasks. The Work Packages 'Research Strategies', 'Dual Studies' and 'Industry Standards' reported about the status of their data collection and the assessment of the base of operation in the respective country. The outcomes will be finalised in a report for each Work Package that will be available in March 2015. In addition relevant sta-

keholders in the target countries were identified with the aim to consequently include interested stakeholders in further project activities. The two Work Packages dealing with energy concepts for model regions provided information about the local conditions in the respective regions and presented how they will proceed with the collection and evaluation of energy production and consumption data. Besides research based on secondary data, a questionnaire will be used in both Work Packages to gather more detailed information directly on-site. For the wetland area a comprehensive report is planned on energy

production and consumption of tourist services in the fragile Okavango Delta while for the dry-land area a handbook for collecting and evaluating energy production and consumption data for and of mini-grid systems will be conceptualised. These outputs will also be available in March 2015.

In addition the project team received insight in the state of teaching and research at the THI through specialist presentations and visits of laboratories given by THI representatives around Project Leader Prof Wilfried Zörner (Head of Institute of new Energy Systems, InES). Also, visits to the Ingolstadt Townhall, the Educational Centre Ingolstadt of the Chamber of Trade for Munich and Upper Bavaria and to operators and companies in the region that are engaged in renewable energies were part of the program.

After the intensive project week with the African partners in Ingolstadt, Project Leader Prof Wilfried Zörner is satisfied: 'Our international project team has noticeably grown together since the start of the project on 1st March 2014 and is motivated to implement this ambitious project. It is thereby our aim to search for tailor-made solutions in each country which are suitable for the population.'



Above: Official reception of the NEED Project Team at the old townhall of Ingolstadt with Major Sepp Missbeck; On the right: Visit of a wind turbine with a capacity of 2,3 MW; Below: Opening of the first NEED project meeting through the President of Technische Hochschule Ingolstadt, Prof Walter Schober [Source: THI]



On the left: Visit of a Biomass Cogeneration Plant, Below: Tour through the laboratories of Technische Hochschule Ingolstadt., including a visit of the sun simulator [Source: THI]



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