

## Programme on Energy Efficiency in Southern Africa (PEESA)

The PEESA project focuses on the development of master programmes in engineering education in southern Africa. The aim of the project is to deliver high-level post-graduate programmes in the field of Energy Efficiency using an outcome-based approach for curricula design. For this purpose internationally agreed quality standards will be adopted, enabling institutional networking and student exchange in the future. This programme will offer a mix of subject and research options that look at the specific regional energy resources in light of their specific societal needs.

**Contract**  
DCI-AFS/  
2013/320-301

**Co-ordinator**  
Hochschule Wismar:  
University of Applied  
Sciences, Technology,  
Business and Design

**Partners**  
Ernst Abbe Fachhochschule  
Jena  
Fachhochschule Flensburg  
Cape Peninsula University of  
Technology  
Polytechnic of Namibia  
Tshwane University of  
Technology  
Vaal University of Technology

**Associate**  
ENAE

**Project duration**  
36 months

**EU grant**  
EUR 468,648.97

**ACP regions and  
countries involved**  
South Africa  
Namibia

**Technical  
Assistance Unit**

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### Challenge

South Africa, with its coal and oil based energy consumption, is the largest energy consumer and greenhouse gas emitter in Africa. Rising energy prices are significantly burdening Africa's economic development, especially for poor households. The direct environmental and health impact of current energy use practices are already impacting the socio-economic situation within large sectors of the population. African countries, such as South Africa and Namibia, must find ways to combine the needs of the labour market with formal education. On the university level, the proportion of engineers in Africa is the lowest worldwide. Education in technical fields is expensive and the skills required are scarce.

### Focus

The project will provide energy sectors in South Africa and Namibia with graduates with the necessary skills required for the energy sector. The sector is constrained by a shortage of skills necessary for addressing energy efficiency practices. To develop the qualification structure and curricula, activities will be based on an interactive process between stakeholders that will improve the quality of higher education provided and link the education system to market needs.

### Rationale

In the midst of the acute energy challenges of the 21st century, the trend is to continue offering conventional engineering programmes, yet there is an industrial demand for graduates who can tackle the energy challenges. A new educational offering dedicated to energy is essential, structured using modern approaches, technologies and standards. This transition calls for developing an interdisciplinary approach and the ability to combine theory and practice. Whilst educational institutions in southern

Africa possess the necessary scientific and technological capacity, they often lack the innovative capacity to develop these into programmes that have a true impact on the opportunities that exist. The outcomes of this Project will create a platform for innovation in the Energy Access and Efficiency sector.

### Method

PEESA will focus on ensuring national and regional quality assurance standards for the developing engineering programmes. It will also align quality requirements between European and African national standards. One outcome of PEESA is the development of guidelines for the design of engineering curricula that includes requirements for learning outcomes at Master's level used within the Bologna Process criteria for accreditation of engineering programmes (Master's level), and a comparison of the government education standards in South Africa and Namibia. It will further describe a methodology for engineering curriculum design,



Visiting the largest rooftop PV installation (09.05.2014 - Windhoek, Namibia)



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### Programme theme(s)

Energy access and efficiency

### Sector

Education policy and administrative management

Energy education/training

### Keywords

Energy access and efficiency, sustainable development, academic capacity building, quality and accreditation standards assurance, engineering education

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### Project website

[peesa.polytechnic.edu.na](http://peesa.polytechnic.edu.na)



Kick-off and 1<sup>st</sup> Project Board Meeting. Group photo of project partners (10.12.2013 - Cape Town, South Africa).



WP1, Act. 1.1 Workshop on standards alignment. Dr. Jan Smit from Vaal University of Technology presents "Quality Standards for Engineering Education in South Africa" (08.05.2014 - Windhoek, Namibia).



WP1, Act. 1.1 Workshop on standards alignment. Group photo of project partners (08.05.2014 - Windhoek, Namibia).

in accordance with EUR-ACE Framework and federal standards of the respective African countries. Such harmonised structures and systems will improve mobility and facilitate higher education cooperation in Africa itself (through mobility schemes such as Nyerere), as well as between Africa and Europe and other parts of the world (through programmes such as ERASMUS). This, in turn, will support sustainable development and the gradual integration of the ACP countries into the EU HEI sector.

### Results

The project will develop methodology for engineering curriculum design in order to structure programmes and graduates' competences, based on the alignment of EU quality standards taking into account the national educational requirements. Guidelines for designing an engineering programme within a harmonised quality assurance system on both a European and African level will be published at the end of the project.

Four Master's programmes in the field of Energy Efficiency at the African partner universities will be developed and adapted with a guideline on engineering programme design and curriculum and syllabus development, and by September 2015 be ready for implementation. The new programmes will be based on updated syllabi and teaching materials with credits allocated to learning outcomes.

The project will develop and implement a "train the trainer" online programme at Master/PhD level. Faculty staff, 10 from each African partner institution, will be trained for curriculum design and programme implementation. This will contribute to providing regional solutions for teacher shortages.

The project will aim to update and implement a quality assurance system within the partner institutions aligned to EU quality standards. The implemented programmes will be evaluated by peers against EU and African standards.