

# LeNS.es – the Learning Network on Sustainable energy systems

## SUMMARY OF RESULTS

Curricular and lifelong learning capacity was built on 'System Design for Sustainable Energy for All' with the inclusion of equity and gender issues:

- Four pilot and four permanent curricular courses have been implemented in the participating African HEIs.
- Four lifelong learning modules have been implemented targeting local stakeholders in the participating African countries.
- An Open Learning E-Platform has been established.
- An international conference was organised and an international students' design prize awarded.
- The book 'Designing Sustainable Energy for All' has been published (open access).

## BACKGROUND

Expertise on how to design, engineer and implement locally-based Sustainable Energy System Design & Engineering is generally limited within the participating African countries. This is linked to the problem of connecting academic knowledge with local needs and priorities and developing appropriate curricular courses and lifelong learning modules.

The project aimed to contribute to human resources and curriculum development in the field of Sustainable Energy for All, by enabling African Higher Education Institution (HEI) teachers to deliver didactic curricular courses and lifelong learning modules to enable students and professionals to develop locally-based, secure and cleaner energy services, based on the promising models Sustainable Product-Service System (S.PSS) applied to Distributed Renewable Energy (DRE). To achieve the stated aims while promoting local knowledge and know-how in the topic, exchange activities (i.e., four pilot courses, four permanent curricular courses and four lifelong learning courses) have been implemented. An Open Learning E-Platform (OLEP) was also implemented supporting a multi-polar production and dissemination of knowledge among African and European HEIs with an open access ethos.

## METHODOLOGY

### Design of didactic curricular courses and supporting learning resources

Joint development of syllabuses, learning resources and tools.

### Implementation of didactic curricular courses

Implementation of four pilot and four permanent didactic curricular courses at the participating African HEIs.

### Design of lifelong learning modules

Joint development of syllabuses, learning resources and tools.

### Implementation of lifelong learning modules

Implementation of four pilot lifelong learning modules targeted at local companies, non-governmental organisations (NGOs) and research bodies.

### Open Learning E-Platform

Development and management of a web platform for the decentralised production and collation of learning resources.

### Dissemination of project results

Final conference and teachers' workshop; students design award set-up and implementation; editing and publication of a didactic book on 'System Design for Sustainable Energy for All' (SD4SEA).

*Sustainable Energy for All by Design conference, Cape Town, South Africa (September 2016).*

## PROJECT IMPLEMENTATION PERIOD

October 2013 – October 2016

## CONSORTIUM

- Politecnico di Milano, Italy
- Brunel University, United Kingdom
- Delft University of Technology, the Netherlands
- Cape Peninsula University of Technology, South Africa
- Makerere University, Uganda
- University of Botswana, Botswana
- University of Nairobi, Kenya

## PROJECT CONTACT

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## PROJECT WEBSITE

[www.lenses.polimi.it](http://www.lenses.polimi.it)

POLITECNICO DI MILANO



DIPARTIMENTO DI DESIGN



the Learning Network  
on Sustainability

## RESULTS

### → Outputs

#### Capacity Building

- 4 pilot and 4 permanent didactic curricular courses on System Design for Sustainable Energy for All (SD4SEA).
- 4 pilot lifelong learning modules on SD4SEA.
- 10 courses with 100 lectures with slides (143 presentations) and videos (100, average 30 minutes) and contributions by 37 professors / lecturers / researchers and 40 students' projects and 30 case studies cases on SD4SEA.

#### Databases/websites/platforms

- Open Learning E-Platform (OLEP): [www.lenses.polimi.it](http://www.lenses.polimi.it)
- A modular e-package for educators /

researchers.

- Learning resources (videos and slides of complete courses, design tools, case studies, promising projects) downloadable in open access and available to modify and reuse.

#### Networking

- LeNS Africa Universities network with 14 HEIs from 8 countries.

#### Documents

- Guidelines for the design and implementation of didactic curricular courses and lifelong learning modules (available at [www.lenses.polimi.it](http://www.lenses.polimi.it)).

#### Visibility/Conference

- Conference 'Sustainable Energy for All by Design', 28-30 September 2016, Cape Town.
- A design competition for young designer projects awarded best (sustainable) concepts.
- 50 groups of winners and 'promising projects' (published in the catalogue 'A world of Sustainable Energy for All in Africa', open access and available at [www.lenses.polimi.it](http://www.lenses.polimi.it)).

#### Publications

- Vezzoli C. *et al.*, 2018. *Designing Sustainable Energy for All*. Springer, London.

### ↑ Outcomes

- A new generation of designers / engineers are primary actors in actively promoting SD4SEA.

- Researchers and educators have open access to knowledge, study approaches, strategies, methods and tools related to

SD4SEA.

- LeNS Africa Universities network able to diffuse SD4SEA in members' curricula.

### 🎯 Impacts

#### Usage

- DRE, if directly managed by final local communities and organisations, can potentially bring about a democratisation of access to energy and increased participation.
- Gender equality issues have been considered in the project, favouring the creation of local design and engineering consultancies capable of (co)designing and (co) developing energy systems.

#### Policy implications

- Initiatives related to co-operation in higher education both at national and international level will be implemented by the LeNS Africa Universities network.

#### Sustainability

- The OLEP platform supports a process of mutual learning, facilitating access, exchange, review and update of knowledge among HEIs and is intended as a

learning-by-sharing mechanism among researchers and educators.

- The book 'SD4SEA' will also support the sharing of knowledge and know-how, along with related approaches, methods and tools.



The first two lifelong learning courses with companies and practitioners have been successfully completed at the Cape Peninsula University of Technology (17-22 February 2016) and the University of Nairobi (5-8 April 2016). A total of 17 companies and consultants working in the renewable energy sector attended the training sessions. The other courses were implemented at the University of Botswana (2-6 May 2016) and Makerere University (18-22 July 2016).