

Africa needs innovative energy engineers to achieve sustainable energy for all.

A high quality curriculum in the energy sector is what the world's poorest continent needs to achieve **sustainable energy for all**. This was the underlying view of at least most of the participants at the recently concluded forum on energy engineering education and research.

The forum, held from the 20th to 21st of March took place at the Nelson Mandela Africa Institute for Science and Technology, Arusha - Tanzania. It saw the participation of private sector, civil society and the academia from universities across Africa.

“The energy sector is undergoing a structural change, its turning green and we need a new breed of energy engineers to be able to come up with energy innovations and solutions in this field” says Professor Emanuela Colombo, UNESCO Chair in Energy for Sustainable Development of Politecnico di Milano - Rector's delegate to cooperation and development.

The forum was based on the **ENERGISE** (Enlarged Network in Education and Research for a Growing Impact of Sustainable Energy engineering on local development) project which is under the ACP-EU co-operation programme in higher education Edulink. The project aims at promoting innovative and labour driven curricula in energy engineering within higher education institutions while enforcing their capacity to interact with the local socio-economic framework through joint researches, outreach programmes and effective networking to support appropriate strategies for local energy access.

“We need to empower locals through qualified education and training, high level research, knowledge and technological cooperation in order to have local energy solution proposed by the people”, says Professor Emanuela Colombo.

The project is currently enforcing the capacity and the networking of four higher education institutions in Ethiopia, Kenya and Tanzania in order to deliver high quality curricula in the energy sector. These are Jimma University institute of technology - Ethiopia, Dar es Salaam institute of technology - Tanzania, Technical University of Mombasa and Technical University of Kenya based in Kenya.

“The energy engineering curricula is geared towards creating innovative energy engineers that will turn ideas into businesses” says Professor Suki Mwendwa, Deputy Vice Chancellor at Technical University of Kenya. *“Africa needs an education system shift that encourages innovations and entrepreneurs”*

According to the World Energy Outlook of the International Energy Agency (IEA) more than 95% of energy poor people are in sub-Saharan Africa. Sub-Saharan Africa has become the most electricity poor region in the world. Africa is one of the richest continent in energy resources, but is the poorest in terms of energy supply (13% of the global population, only 4% of the global energy demand). The energy system and the poor energy infrastructure are limiting factors:

- to cover the daily basic need at household level;
- to meet the community services;
- to promote productive uses in industry and agriculture.

Energy and development are closely linked. Energy plays a fundamental role in shaping the human condition and is the key to socio-economic progress especially for developing countries. The relevance of energy in the international scenario has constantly risen and the many interconnections with environment and society are acquiring evidence. However, the unsustainable way in which most of the energy is currently produced and consumed threatens the environment at both local and global scales. The need to increase the access

to modern energy services for balancing the economic, social and environmental dimensions of sustainable choices is nowadays worldwide recognized: affordable energy services are key elements of economic development and eradication of extreme poverty. Therefore, providing reliable, affordable and sustainable access to energy has become a core focus of the international development community as this is vital to socio-economic growth and development of countries in Africa. At the forum the consensus was that involvement of all stakeholders at all levels is important for the achievement of sustainable energy for all. There was also an agreement that a people centred approach should be at the core of all energy solutions.

“Africa's tremendous renewable energy potential and young energetic human resource potential should be exploited to tackle its energy challenge”, says Professor Suki Mwendwa. The forum also provided a platform for some energy entrepreneurs to share experiences and best practice. Africa's energy poverty has also made the region a big market for investments in alternative sources of power especially clean energy by both regional and international firms.

According to Lois Gicheru CEO at Solafrique a Nairobi based solar company says that the new wave of energy entrepreneurs on the continent is a beacon of hope for the 600 million energy poor Africans but adds that more energy engineers and entrepreneurs are needed because the energy potential is immense and so is the market.

Solafrique offers a range of high-quality solar systems designed to fit the needs of low income rural households. However she says that government red tape, bureaucratic tendencies and policy continue to stand in the way for private energy investments.

There was also recognition that Africa as a continent continues to bear the biggest brunt of

climate change due to low resilience and weak capacities, with the youth despite their huge numbers and innovativeness among the vulnerable. Another point of concern was the massive use of traditional dirty biomass energy fuels. More than 2.7 billion people, primarily in developing Asia and sub-Saharan Africa, rely on fuel wood and other traditional biomass sources for cooking. This situation continues to rob many their basic right to a clean and healthy environment.

“Biomass energy is at the heart of the energy mix in Africa, we need innovations that will make biomass cleaner” says Professor Emanuela Colombo and more *“access to clean energy should be an instrumental right”*.

What the participants have recognized to be crucial in order to achieve a Sustainable Development is that Energy Solutions must be designed **FOR** the people, **BY** the people, **WITH** the people.

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