

Lecture 7 - 31/11/2023 - Wim Deferme, Luc Bijmens & Bonaventure Banza

Title: "Sustainable Energy Solutions in Sub-Sahara Africa"

Abstract

PART 1: Students for Energy in Africa - a multidisciplinary approach to tackle Energy-issues in Sub-Sahara Africa

In a recent report of the World Bank 32 of the 48 countries on the African continent are declared in an energy crisis. Energy is a scarce commodity and, however there are many sources of energy, access to clean and renewable sources of energy is not that straightforward. Energy for cooking and heating for example is often taken from fossil fuels such as wood and LPG. In the whole of Africa, many forests are cut for their wood to use it directly for burning or to prepare charcoal from it. Environmental degradation and natural resources depletion remains a daily reality disproportionately hitting hardest the poor and the most vulnerable groups in the community. According to the forecast by the recent World Energy Outlook on how to finance or support access to clean energy, the energy technologies should be centered on renewable energies with an innovative approach focused on a "needs resource balance" based design. In line with this approach, the cooking and heating systems should shift from LPGs, wood fuels or other fossil fuels to home based or community based Solar and/or Biogas systems. Academia plays a vital role in providing access to clean energy through training and research. However, typical approaches always start from a very one-directional vision on the problem and/or the solution. Therefore, it is important that a full stakeholder approach is set up, merging different disciplines, partners from North and South and local communities. In this presentation, we will show examples of Energy projects developed by Engineering students from the North and pinpoint the necessity of involving all necessary disciplines and stakeholders to come to sustainable energy solutions.

PART 2: Solar cookers for all - a collaboration between the university of Lubumbashi, Congo and UHasselt"



About 2.4 billion people around the world cook over fires made of wood, animal waste or charcoal because they lack sustainable fuel (solarcooker.org). In doing so, they inhale the smoke and soot that is known to cause serious health problems.

The “Solar Cooker for All (Sc4all)” project aims to co-create solar cookers with the most vulnerable communities in Lubumbashi, Democratic Republic of Congo (DRC) and further strengthen the knowledge gained. These stoves use free solar energy, allowing

people to breathe clean air and drink clean water while saving the environment.

The specific objective of the project is to design low-cost solar cookers for domestic use. Solar cookers are commercially available but are most often imported and very expensive. Moreover, they are not necessarily adapted to local needs of potential users in middle- and low-income countries. Therefore, an important requirement of our project is that the newly developed solar cookers are made locally from recycled materials and that these cookers meet local needs. At the same time, a business plan for local small businesses will be developed so that the final product can be manufactured locally and distributed at low cost, benefiting the most vulnerable families.

To produce these low-cost solar cookers, the project has started a multidisciplinary research and development line at the University of Lubumbashi (UniLu, DRC), in collaboration with Hasselt University (UHasselt), to test new prototypes. To achieve this, the interdisciplinary expertise of many different faculties present at both universities will be integrated to enable maximum exchange of expertise. This project will be considered a success when the UniLu team achieves international recognition in solar cooker R&D, with the help of the UHasselt team. We are confident that our low-cost prototypes will be suitable for small businesses to produce and sell anywhere in the DRC, Africa, or even in the world. Finally, the Sc4all project will train a new generation of students to propose innovative solutions for many of UNO's strategic development goals, ensuring the sustainability of the project.

Over the last year UHasselt students have built an electronic weather station for testing the performance of prototypes. They also tested the reflective capacity of recycled materials to investigate their applicability in two prototypes. During the entire month of July 2023, a team of students from both universities have collaborated in designing and testing several low-cost prototypes in the Democratic Republic of Congo. In this lecture the preliminary results of the Sc4all-project will be presented. At the same time the implementation plan of the Sc4all-project will be explained.