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# SUSTAINABLE ENERGY SOLUTIONS PROGRAM IN WEST AFRICA PAVES WAY FOR FUTURE DEVELOPMENT

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## West Africa



Energy issues facing society are one of the biggest technological and policy challenges of the twenty-first century. For this reason, the Sustainable Engineering Lab is working to design an innovative distance-learning program intended to build skills of experts in the field of sustainable energy systems and solutions, beginning with a pilot group of West African students.

### **Fellowship students**

The first round of the program includes nine West African experts currently employed by utilities, regulators or independent power producers (IPPs) in the areas of renewable energy technologies, energy efficiency and energy policy planning. The overall objective is to strengthen the long-term capabilities of these institutions and companies to design and appraise projects, integrate renewable energy and energy efficiency into their planning, operational and monitoring cycles and contribute to strengthening of policy framework at the national level. Recent studies and reports by various organizations including ECREEE and UNIDO have revealed that lack of capacity, knowledge and awareness on the technical feasibility and economics of renewable energy and energy efficiency technologies and systems is still a major barrier for scaling up clean technologies and investments in the electricity sector of countries of West Africa.



*Fellowship students visiting Cabeólica wind farm in Sao Vicente during hands-on workshop.*

## Partners



## Structure of Course

The certificate program includes e-learning lessons by Vijay Modi, lead of SEL, as well as other faculty members of Columbia University. In addition to a physical workshop held in Mindelo, Sao Vicente. Written exams for each course take place in the form of tests, home works and MATLAB assignments in line with standards and procedures applied by the concerned School of the Columbia University. The program ends with a final exam. The courses are held exclusively in English. Successful students will receive a Columbia University's Certificate of Professional Achievement in Sustainable Energy.

## Curriculum

The specific topics to be covered range from energy sources, energy conversion technologies, and energy infrastructure planning to applications and implementation as they pertain to different energy services. System level issues about integration of renewable energy and incorporating energy efficiency will be addressed. The program will offer a broad overview of possible renewable energy and energy efficiency technologies and their unique characteristics. The curriculum will train students in quantitative tools that assist in decision-making when multiple technological choices that have varying spatial and temporal capabilities/impacts are present. Technologies that rely on a combination of renewable and storage and combination of power with heat/cooling (cogeneration) are critical to capture in the curriculum. For a global curriculum, ability to plan with local resources, temporal variability of the resource and the appropriate centralization/ decentralized level of the infrastructure is also important. Students will also develop the capacity to design and assess bankable projects that connect demand to supply.