

Engineers tending to Cameroon's power grid

June 29 2015, by Anne-Muriel Brouet



Credit: Nicolas Crettenand

EPFL has teamed up with Swiss and Cameroonian partners to address major issues like stabilizing the country's existing grid, improving energy efficiency and developing hydroelectric potential.

Cameroonians call it 'load-shedding.' They are referring to ill-timed and never-ending power cuts. More than 70% of the population is not directly affected, however, because they are not even on the grid. For those on it, the grid's unreliability is the root cause of numerous challenges, especially in hospitals.

These problems are the focus of concern for engineers from the University Research Center on Energy for Health Care (CURES), a joint laboratory between EPFL – represented by the EssentialTech programme of the Cooperation and Development Center (CODEV) –

and the Yaoundé National Advanced School of Engineering (ENSP). The engineers' conclusions are unequivocal: electrical equipment at hospitals is in poor shape, daily power cuts last up to three hours, electrical fires take place and power surges destroy household appliances. At peak hours, the grid does not generate enough electricity to run sterilizers, and the cuts even affect the lighting in operating theatres. Lives are at stake.

"Adaptable, sustainable and affordable solutions"

An in-depth study was carried out in the framework of the CROSS program. This programme, co-financed by EPFL and the University of Lausanne (UNIL), develops technological solutions with both socioeconomic and institutional dimensions. A system using batteries and inverters specially designed for tropical climates was developed and tested in the laboratory. During slack hours it stores up the energy required to meet the needs during peak hours or during power cuts and load-shedding. This solution also isolates and protects electrical equipment from sometimes destructive disruptions on the grid.

The total cost of this solution over 10 years – purchase, operations and maintenance – represents 14% of the average annual cost of a hospital's energy supply. An economic model was used to study the possibility of financing the solution with the resulting savings, which stem in large part from the diesel fuel used for the generators. "The solutions that we come up with have to be adaptable, sustainable and affordable," said Nicolas Crettenand, who just spent two years in Cameroon as EPFL's chargé de mission. If the model is successful, hospitals in Cameroon and other developing countries will be able to function more effectively.

Promoting Swiss know-how in hydroelectricity

Alongside this effort, EPFL is also engaged in an initiative at the national level to help develop the country's [hydroelectric power](#). Cameroon is one of four countries on the African continent with significant hydroelectric potential. 70% of electricity production in the country is already the result of hydropower, but that represents only 5% of the potential capacity of this energy source. At the same time, the electrification rate is 50% in cities and 5% in the countryside.

Academic and industry partners in Switzerland put together a consortium that is concentrating on small and medium-sized power stations. "At this stage, there is a serious shortage of power stations in Africa with capacity between several hundred kilowatts and several dozen megawatts, and this is a range in which Switzerland has special expertise," said Crettenand, who ran this project as part of his mission with EPFL's Energy Center.

The consortium aims to work, with local partners, in a spirit of integrated and sustainable development. "We want to develop projects in which hydropower complements other sources of renewable energies and, insofar as possible, provides ways to store energy in storage plants and pumped-storage stations. This type of storage helps with the technical regulation of the power grid and with developing small grids," said the researcher. The consortium, still more of an interest group at this stage, hopes eventually to help alleviate the electricity problems, especially for the hospitals.

Provided by Ecole Polytechnique Federale de Lausanne

Citation: Engineers tending to Cameroon's power grid (2015, June 29) retrieved 18 April 2024 from <https://phys.org/news/2015-06-tending-cameroon-power-grid.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.