

All-terrain technology for developing countries

February 8 2013



© EPFL

EPFL is launching "EssentialTech," a unique program in which engineers will in particular produce medical devices custom-designed for the difficult conditions encountered in developing countries.

<u>Medical equipment</u> has a tough time in <u>developing countries</u>; the supply of electricity is unreliable, components are costly and fragile, and there



is a lack of qualified personnel for maintenance. To solve this problem, EPFL's Center for Cooperation and Development is launching an ambitious initiative. The EssentialTech program brings together companies and <u>research institutions</u> from north and south with the <u>common goal</u> of <u>developing new technologies</u> that are custom made for the needs of developing countries. Scientists are currently working on a <u>medical imaging</u> device that can operate in extreme and difficult conditions. A prototype of a <u>power source</u> and a high-voltage circuit, jointly developed between EPFL' Distributed <u>Electrical Systems</u> Lab and the Universities of Applied Sciences in Sion and Yverdon, are already being tested.

More than two-thirds of medical equipment is never used

The WHO statistics are alarming. More than 70% of high-tech medical equipment sent to Africa is never used, due to lack of adequate infrastructure or trained maintenance personnel. Even when the equipment can be put into service, electrical surges or hot and <u>humid</u> conditions often result in failure after just a few months of use. "Sometimes, we have to deal with problems that are as trivial as they are unsolvable," explains EssentialTech program director Klaus Schönenberger. "For example, some material we simply can't even plug in, because it requires three-phase current, such as we use for our electric stovetops, and the hospital is only equipped with standard single-phase current."

A custom-made imaging device

EssentialTech's basic idea is simple but ambitious – to totally rethink the design of medical equipment. The first project is a medical imaging device designed specifically for the needs of developing countries. Engineers are working on a power supply and a high-voltage circuit that can provide uninterrupted power in the presence of power surges and



power outages.

Two-thirds of the world population doesn't have access to imaging technology, explains Schönenberger. By combining x-ray and ultrasound technology, the machine will be able to cover 90% of the needs of a typical district hospital.

In Switzerland, more than 20 engineers are working together with the EPFL team to design the prototype. The Universities of Applied Sciences in Yverdon and Sion are involved in developing the electrical circuits. The Paul Scherrer Institute (PSI) is in charge of developing the imaging component, and the Lausanne University Hospital (CHUV) is providing practical expertise. On the industry side, scientists are benefiting from the know-how of Swiss company Betschart AG.

Cameroon is a partner in the project. EPFL and the Ecole nationale supérieure polytechnique de Yaoundé recently signed an agreement for a joint laboratory. Swiss and Cameroon researchers, with the participation of local partners, will field test the imaging device and put in place a strategy to deploy it at an affordable price.

Going beyond traditional philanthropy

For Schönenberger, a project like this is much like working with the space industry. "Once it's launched, a satellite must be able to function for years. It's the same with medical equipment destined for the outback. Except in our case, we have to take into account cost and mass-production considerations."

EssentialTech has a clear and unique philosophy. The goal is clearly to establish a trade chain that can benefit each participant. This is an important issue, according to Bertrand Klaiber, head of commercial strategy in EssentialTech. "It's a situation in which traditional



philanthropy shows its limitations. To ensure the survival of the system, you can't be dependent on sporadic donations; you have to develop chains for production, distribution, education and maintenance in which every actor is paid for his or her work."

Energy and water treatment

Engineers are also working on an incubator for newborns, and looking into developing modules that could stabilize electricity supply in hospitals. The EssentialTech team is also already applying the basic idea in other critical areas such as drinking water treatment and energy. A complete first prototype of the <u>imaging device</u> should be ready within two years.

Provided by Ecole Polytechnique Federale de Lausanne

Citation: All-terrain technology for developing countries (2013, February 8) retrieved 27 April 2024 from <u>https://phys.org/news/2013-02-all-terrain-technology-countries.html</u>

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.