A green battery for home use in rural Africa

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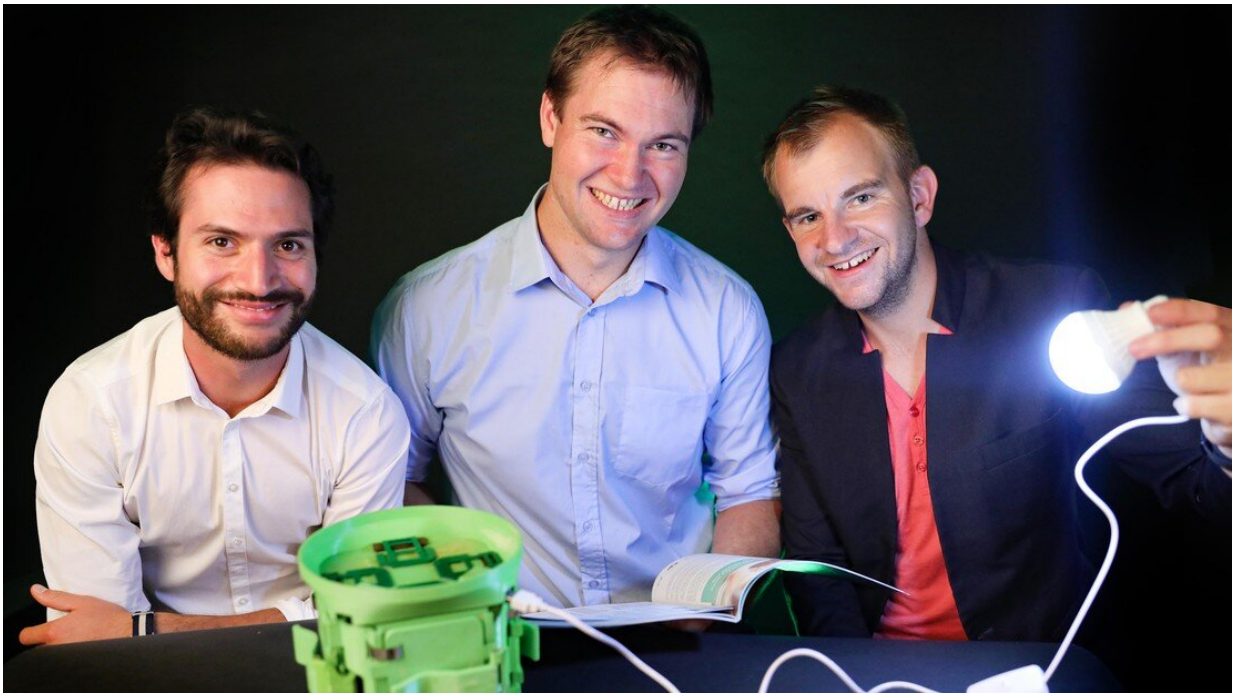

Credit: Ecole Polytechnique Federale de Lausanne

EPFL startup hiLyte has developed an eco-friendly battery that will allow people in Sub-Saharan Africa to light their homes and charge their cell phones. The technology is currently being tested by families in Tanzania.

Over a billion people worldwide live without electricity. The problem is especially acute in rural areas of Sub-Saharan Africa, where many

families spend their evenings in darkness and most cell phone owners are unable to charge their device at home.

hiLyte, a startup founded by two graduates of EPFL's School of Engineering (STI), has developed a clean, affordable battery using iron, water, coffee filters and carbon felt. With a single charge, the battery can power an LED bulb for five hours or charge a cell phone. Once used, the liquid inside can be safely released into the environment.

A dozen of prototypes manufactured and distributed through a local branch managed by local staff are currently being tested in families. "Our technology has the potential to change people's everyday lives," says Briac Barthes, who holds a Master's in Mechanical Engineering and co-founded the company. "For one of the pilot families, the battery allowed their daughter to study in the evening. Having light can also transform the way people interact, bringing socialization opportunities for isolated and vulnerable families."

An alternative to kerosene

Currently, people living in rural parts of Tanzania use kerosene lamps to light up their homes when it gets dark. But kerosene is an expensive and highly flammable fuel that emits harmful soot particles when burned. "Breathing kerosene smoke in a confined space for five hours is as bad for your lungs as smoking two packs of cigarettes," explains Barthes.

Iron foil, coffee filters and carbon felt

The new reusable, four-compartment battery solves most of these problems. To generate power when needed, the user simply has to reload the unit with consumables. First, sheets of iron foil, coffee-filter paper and carbon felt are inserted through the four doors. Next, the user pours a solution of water and iron sulfate powder inside the battery. As the

liquid soaks into the carbon filter, it slowly dissolves the iron foil. This process releases electrons, thereby generating electricity. Users can then harness this power by connecting a lamp or cell phone to the battery's built-in USB port.

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The reaction produces iron 2 sulfate, a harmless liquid widely used as an agricultural fertilizer.

The battery costs around half as much as a kerosene lamp. The unit itself retails for 12 dollars, while the consumables cost just 12 cents per

recharge. "Once recharged, the battery produces five hours' worth of electricity," says Barthes.

The company is currently focusing on Tanzania but plans to eventually expand into other markets.

More information: For further information, visit the hiLyte website: hilyte-power.com/

Provided by Ecole Polytechnique Federale de Lausanne