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Eco-friendly Sweat-Powered Batteries: Singapore Scientists Develops Sustainable Battery Prototype To Promote Electronic Waste Decrease

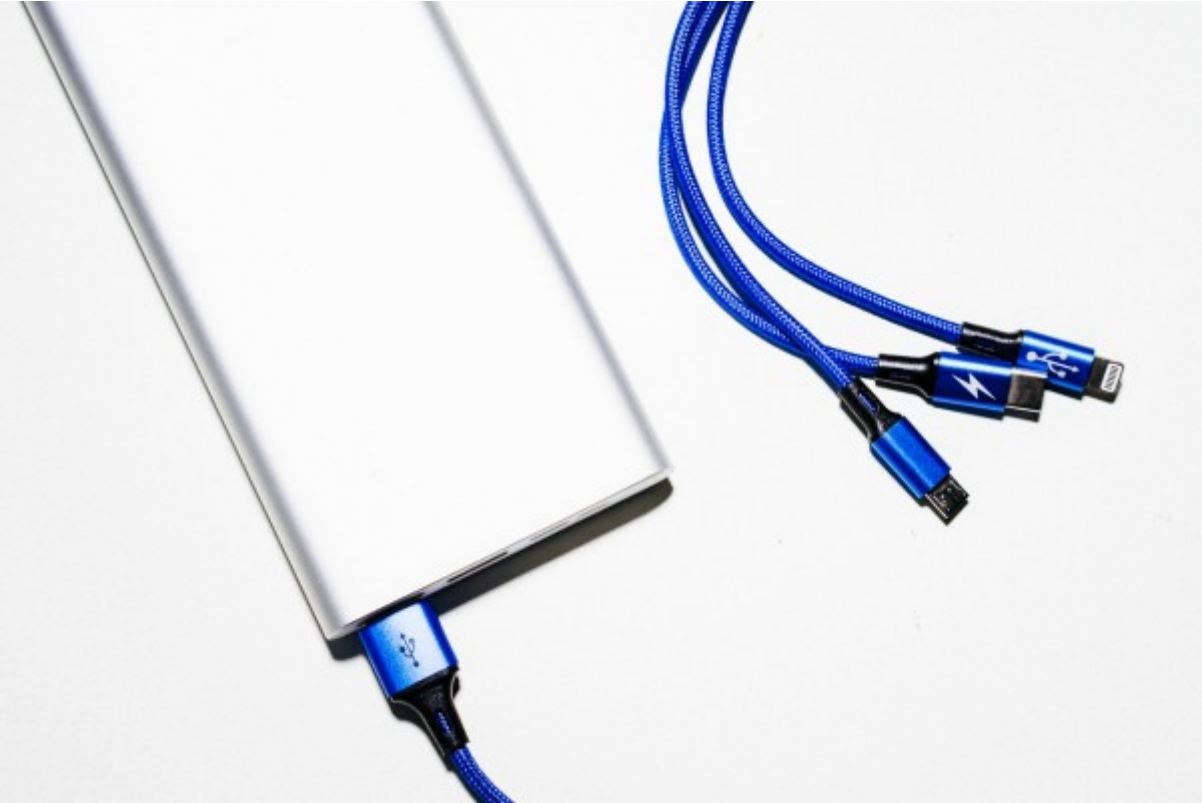
Ron Jefferson Aug 17, 2021 08:36 AM EDT



Nanyang Technological University experts recently developed a new innovative battery that is powered by sweat. Singaporean scientists made the prototype battery to be stretchable and soft.

The human perspiration-powered energy source is composed of unconventional materials, including silver flake electrodes that were printed out for generating electricity once in contact with human sweat.

Sweat-Powered Battery by NTU Singapore



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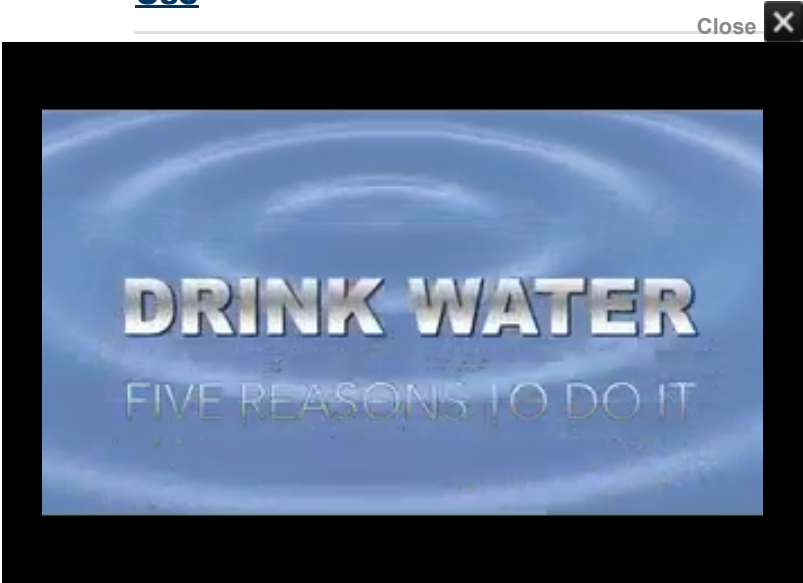
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The sweat-powered electric battery prototype is made with the size of two copy papers, flat-surfaced, and scaling at 2 x 2 centimeters.

The battery is made purposely flexible, stretchable, or compatible with wearable devices. The tactile used for the battery is liquid-absorbent for harvesting perspiration.

According to [Tech Xplore](#)'s report, the battery is expected to be attached with devices such as watches, arm straps, or wristbands in the future. The perspiration-enabled battery was designed to be capable of running side by side with devices that have biosensors.

To examine whether the battery will perfectly perform its features, researchers tested the energy source with a laboratory-produced human sweat. The electric battery has gone through a series of experiments to assure its effectiveness when contacted with human perspiration.

One of the examinations included a participant wearing the battery on their wrist as they pedaled in a stationary bicycle. After the 30-minute workout, the battery was able to harness a charge of 4.2 Volts that has an output power of 3.9 milliWatts.

The experiment was a success, as these power source measurements are comparable to the minimum battery life required by commercially available sensor devices.

The findings from the trials are a perfect match for the minimum battery requirements of a wearable sensor that can continuously synchronize the information on any device through wireless connections.

The peer-reviewed study regarding the sweat-operated battery was published in the journal [Applied Science and Engineering](#), titled "Printable Elastomeric Electrodes With Sweat-Enhanced Conductivity for Wearables."

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Sustainable Battery vs. Electronic Waste

The sweat battery is made out of specialized materials that do not contain heavy metals or harmful chemicals. The composed materials are selected by the Nanyang Technological University experts to promote an eco-friendly solution to the rising battery wastes that harm the environment.

Manufacturing this kind of battery will be the first to oppose the conventional process of creating classic batteries.

Nanyang Technological University promotes sustainability on their recent innovation, which was hard for many institutes and industrial enterprises to develop.

Among the goals of this project is to decrease electronic wastes for environmental protection. If successful, the sweat-powered battery will serve as a stepping stone for the university's [NTU 2025](#) project.

Traditional batteries are included in one of the world's largest waste contributors. In a report by [The Conversation](#), electronic wastes are increasing by 2.5 million tonnes each year.

Based on the report, the global electronic waste recorded in 2019 summed to a weight of 350 cruise ships or over 53.6 million tonnes. When distributed, the waste each individual contributed was about 7 kilograms.

