

# Researchers develop next-generation magnesium batteries

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A Tainan-based National Cheng Kung University (NCKU) research team has developed next-generation magnesium batteries that could replace lithium batteries.

The team has been working on the research of magnesium battery, and has succeeded in overcoming the problems caused by the [high activity](#) of magnesium and increasing the stability, Prof. Hung revealed.

Prof. Fei-Yi Hung said the stability of the magnesium battery prototype has been increased by controlling the reduction-oxidation effects and by the use of magnesium membrane electrodes and magnesium powder electrodes technology.

He also said, a magnesium battery's capacity is 8 to 12 times higher than a [lithium battery](#), and its charge-discharge efficiency is 5 times higher as well.

Take electric bicycles for example, a bicycle takes 3 hours to charge completely when using lithium battery while only 36 minutes if using magnesium battery, Prof. Hung added.

He said, devices powered by lithium batteries are usually unable to function properly in temperatures below minus-15°C.

However, the team found that if they coated lithium batteries with magnesium, they still worked at temperatures as low as minus-30°C and

as high as 55°C.

"We hope the next-generation battery would be more environmentally friendly," according to Prof. Hung.

Because in the present generation the negative electrode is usually made from graphite, which is made from processed petroleum coke, he explained.

He added that not only are graphite electrodes less capable of storing energy, the processing of petroleum is less environmentally friendly.

While one of the greatest benefits of [magnesium](#) batteries is safety, according to Prof. Hung, the most difficult part in normalizing distribution is the difficulty of making electrolyte solvent.

Provided by National Cheng Kung University

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