Written by Marco Attard
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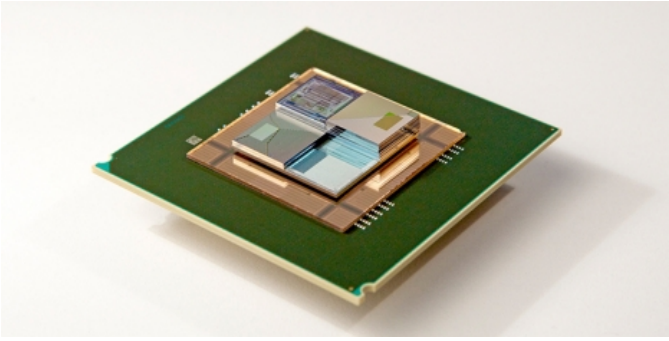
Scientists at ETH Zurich and IBM Research Zurich build what they call a tiny "redox flow" battery-- a battery able to simultaneously power and cool chips, especially those stacked on top of each other, pancake-style.



A flow battery creates electricity through the electrochemical reaction of two liquid electrolytes. A closed electrolyte loop pumps the two liquids into the battery cell from outside, and the liquids also serve as a cooling medium, dissipating excess heat from the chip stack via the same circuit.

The battery built by the scientists is only 1.5mm thick and produces 1.4W per square centimetre of battery surface. It is designed to sit between chip layers, meaning one first has a chip, then a thin battery micro-cell to power and cool it, then the next chip, and so on. This is quite the difference from previous flow batteries, which are large scale and used in tandem with wind farms and solar plats to temporarily store produced energy.

The next step for the scientists is to boost the power density of the small flow battery, which currently is not enough to operate a computer chip.

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