Concrete battery storage

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A mix of cheap, abundant materials could hold electricity from wind or solar in foundations or roads.

A supercapacitor made from cement and carbon black (a conductive material resembling fine charcoal) could form the basis for a low-cost way to store energy from renewable sources, according to MIT researchers.

The amount of power a capacitor can store depends on the total surface area of its conductive plates. Professors Franz-Josef Ulm, Admir Masic, and Yang Shao-Horn and colleagues found that if carbon black is introduced into a mixture with cement powder and water, the water naturally forms a branching network of openings when the resulting concrete cures--and the carbon migrates into that network to make wire-like structures, yielding a conductive material with an extremely large internal surface area.

Two electrodes made by soaking this material in a standard electrolyte, separated by a thin space or an insulating layer, form a very powerful supercapacitor, the researchers found. A cube about 3.5 meters across could store about 10 kilowatt-hours.

The simple technology could eventually be incorporated into the concrete foundation of a house, where it could store a day"s worth of energy. The researchers also envision a roadway that could provide contactless recharging for electric cars as they travel.

It"s "a new way of looking toward the future of concrete as part of the energy transition," Ulm says.

NotebookLM is a surprise hit. Here are some of the ways people are using it.

The game was created from clips and keyboard inputs alone, as a demo for real-time interactive video generation.

Rapid advances in applying artificial intelligence to simulations in physics and chemistry have some people questioning whether we will even need quantum computers at all.

A two-hour interview is enough to accurately capture your values and preferences, according to new research from Stanford and Google DeepMind.

Scientists at the Massachusetts Institute of Technology have developed a low-cost energy storage system that could be integrated into roads and building foundations to facilitate the renewable energy transition.

The research team has created a supercapacitor – a device that works like a rechargeable battery – using cement, water and carbon black, a fine black powder primarily formed of pure carbon.

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