

Toward a 'green grid' for delivering solar and wind-based electricity

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After years of neglect, scientists and policy makers are focusing more attention on developing technologies needed to make the so-called "green grid" possible, according to an article in ACS' *Chemical Reviews*. That's the much-needed future electrical grid, an interconnected network for delivering solar and wind-based electricity from suppliers to consumers.

Zhenguo (Gary) Yang and colleagues point out that concerns over the use of coal, oil, and other fuels that contribute to global warming and are in limited supply, have spurred interest in generating electrical energy from clean, [renewable resources](#) such as solar and wind power. But solar and wind are not constant and reliable sources of power, since wind power fluctuates from moment to moment and solar power is generated only in the daytime.

This situation poses a significant challenge for [electrical grid](#) operators because other [power plants](#) need to compensate for this variability and the U.S. power grid currently has little [energy storage](#) capability. To enable a significant level of penetration and effective use of [renewable energy sources](#) amid growing energy demands, electrical grids of the future will need a low-cost, efficient way to integrate and store this electrical energy, the scientists note.

The scientists analyzed the conclusions of more than 300 scientific studies and identified several technologies that can be used for energy storage for the green grid. These include high-tech batteries now in

development that can efficiently store electricity in the form of chemicals and reversible release it on demand. Among the promising technologies are so-called redox flow and sodium-ion batteries, which could provide a low cost, high efficiency way to store energy.

In addition to the United States, several other countries such as China and countries in Europe are planning to increase research activities related to energy storage and development. "The growing interests as well as worldwide research and development activities suggest a bright outlook for developing stationary energy storage technologies for the future electric grid," the article concludes.

Provided by American Chemical Society

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