Nordic Energy
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New Battery Design Could Help Solar and Wind Power the Grid

Researchers from the U.S. Department of Energy's (DOE) SLAC National Accelerator Laboratory and Stanford University have designed a low-cost, long-life "flow" battery that could enable solar and wind energy to become major suppliers to the electrical grid.

The research, led by Yi Cui, a Stanford associate professor and member of the Stanford Institute for Materials and Energy Sciences, is a product of the new Joint Center for Energy Storage Research (JCESR), a DOE Energy Innovation Hub. Led by Argonne National Laboratory, with SLAC as major partner, JCESR is one of five such Hubs created by the Department to accelerate energy research and was established last November.

"This important early result from JCESR points to the value of mobilizing top researchers in a concerted effort to tackle major energy challenges," said Patricia M. Dehmer, Acting Director of DOE's Office of Science, which supports JCESR. "It also shows the potential for significant progress in batteries and energy storage through transformative scientific research."

While solar and wind make a substantial contribution to the nation's energy supply, they also create significant power fluctuations, which can sometimes exceed the tolerances of the electrical grid. "Flow" batteries, such as developed by Cui's group, can smooth those fluctuations.

Their new flow battery uses a simplified, less-expensive design than other batteries, which may improve its scalability and cost-effectiveness. In laboratory tests, it also demonstrated excellent energy-storage performance through the equivalent of more than 5 1/2 years of daily charge and discharge cycles. The result was reported in the journal Energy & Environmental Science.

Going forward, Cui's group plans to make a laboratory-scale system to optimize its energy storage process and identify potential engineering issues. It also plans to start discussions with potential hosts for a full-scale field-demonstration unit.

Electricity Pricing – Apr 30, 2013

Com Ed	On-Peak	Off-Peak
2013	$.04343	$.02744
2014	$.04249	$.02806
2015	$.04347	$.02867

PECO	On-Peak	Off-Peak
2013	$.05291	$.03420
2014	$.05159	$.03475
2015	$.05255	$.03530

LMP Electric Price

Time Period	Average per Kwh
April, 2012	$.02659
May, 2012	$.02816
June, 2012	$.03089
July, 2012	$.04303
Aug, 2012	$.03112
Sep, 2012	$.03034
Oct, 2012	$.02829
Nov, 2012	$.03327
Dec, 2012	$.03081
Jan, 2013	$.03111
Feb, 2013	$.03219
Mar, 2013	$.03665
Apr 1-Apr 29, 2013	$.03815

Extended Temperature Forecast: Chicago Area

	Tue	Wed	Thu	Fri	Sat
High	83	82	67	58	63
Low	61	54	50	51	50