Study Shows Flexible Solar Can Have Significant Grid Benefits

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Solar that is operated flexibly provides significant added value compared to solar operated as a "must-take" resource

TEMPE, Ariz., Oct. 24, 2018 (GLOBE NEWSWIRE) -- A new study conducted by Energy and Environmental Economics, Inc. (E3) and sponsored by First Solar, Inc. (Nasdaq: FSLR) shows that operating solar flexibly – dispatching on a sub-hourly basis and providing essential grid reliability services – provides significant additional value compared to conventional operating modes in which all solar available output must be delivered to the grid. The detailed technical study, which was posted on E3's website today, uses the PLEXOS Integrated Energy Model to simulate generator unit commitment and dispatch of an actual Florida utility system.

Until now it has been assumed that higher levels of solar and wind electricity create challenges for grid operators due to the variability and uncertainty of their output. This can lead to concerns about grid flexibility, ramping requirements and over-generation, exemplified by the California Independent System Operator's (CAISO) "duck curve." However, a previous study conducted by First Solar, the CAISO, and the National Renewable Energy Laboratory found that solar can be operated flexibly, and in fact can respond much faster than conventional resources to instructions from the grid operator.

Simulating utility-scale solar deployment levels up to 28 percent annual solar energy penetration, the E3 study calculates operating cost savings of adding solar generation to the electricity system under four different solar operating modes representing different levels of flexible grid response. The study finds that operating solar flexibly provides significant additional value compared to other operating modes. This means incorporating solar resources into the utility's real-time dispatch decisions as well as relying on solar energy to provide essential grid reliability services. The increased value stems from expected reduced fuel and maintenance costs for conventional generators, reduced curtailment of solar output, and reduced air emissions. It grows as the level of solar penetration increases.

"The study confirms our intuition that solar can provide the most value to the system if grid operators fully utilize the flexible dispatch capabilities of solar power plants, especially under increased solar penetration levels," said Arne Olson, Senior Partner at E3. "Utilities and grid operators should stop thinking of solar as a problem to be managed, and start thinking of it as an asset to be maximized."

"By leveraging the full suite of operational capabilities that all First Solar resources are already equipped to provide, solar can become an important tool to help operators meet flexibility and reliability needs of the grid," said Mahesh Morjaria, Vice President of Systems Development at First Solar. "Such capability makes it possible for solar to go beyond a simple energy source and instead contribute to important system requirements the way conventional resources do."

Link to the study: https://www.ethree.com/wp-content/uploads/2018/10/Investigating-the-Economic-Value-of-Flexible-Solar-Power-Plant-Operation.pdf

About First Solar, Inc.

First Solar is a leading global provider of comprehensive photovoltaic (PV) solar systems which use its advanced module and system technology. The company's integrated power plant solutions deliver an economically attractive alternative to fossil-fuel electricity generation today. From raw material sourcing through end-of-life module recycling, First Solar's renewable energy systems protect and enhance the environment. www.firstsolar.com

For First Solar Investors

This release contains forward-looking statements which are made pursuant to safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These forward-looking statements include, but are not limited to, statements concerning the results of a technical study. These forward-looking statements are often characterized by the use of words such as "estimate," "expect," "anticipate," "project," "plan," "intend," "seek," "believe," "forecast," "foresee," "likely," "may," "should," "goal," "target," "might," "will," "could," "predict," "continue" and the negative or plural of these words and other comparable terminology. Forward-looking statements are only predictions based on our current expectations and our projections about future events and therefore speak only as of the date of this release. You should not place undue reliance on these forward-looking statements. We undertake no obligation to update any of these forward-looking statements for any reason, whether as a result of new information, future developments or otherwise. These forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to differ materially from those expressed or implied by these statements. These factors include, but are not limited to, the matters discussed under the captions "Risk Factors" and "Management's Discussion and Analysis of Financial Conditions and Results of Operations" of our most recent Annual Report on Form 10-K and our subsequently filed Quarterly Reports on Form 10-Q, as supplemented by our other filings with the Securities and Exchange Commission.

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