

Busting the problem of cloud cover

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The downside to solar power is that it's not always sunny and so grid operators have to compensate for energy drops by bringing alternative generation sources online. New research in the *International Journal of Powertrains*, looks at how short-term forecast of sunshine using satellite images could offer one tool to help power companies maintain a steady supply.

A. Shobana Devi of the Sathyabama Institute of Science and Technology, in Chennai, India and colleagues explain how [solar irradiance](#) forecasting currently represents a major challenge to companies hoping to integrate solar energy resources into the existing structures of energy supply. Fundamentally, it is the vagaries of changing cloud cover that compromise the power output of solar panels. However, it might be possible to compensate for the problem if there were a way to predict cloud movements within a fifteen to ninety-minute window throughout the day.

The team has developed an approach using the long short-term memory (LSTM) technique and tested it against known satellite imagery and the power output of a 250-megawatt solar plant to show that the predictions can be sufficiently accurate to allow [grid operators](#) to balance power output from solar and other sources. Their tests demonstrate that this approach is more accurate than other methods when tested against [cloud cover](#) data accumulated over a seven-month period. Statistical regression models allow them to assess the efficacy of the various models tested.

"The results of experiments verify and affirm that over current techniques, our suggested algorithms can considerably enhance the precision of cloud monitoring and solar energy estimation," the team writes. They add that "this predictive [solar power](#) data in the smart grid can be used efficiently for grid operation (load tracking) and energy management system."

More information: A. Shobana Devi et al, Short-term solar power forecasting using satellite images, *International Journal of Powertrains* (2021). [DOI: 10.1504/IJPT.2021.117457](https://doi.org/10.1504/IJPT.2021.117457)

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