

## Grid stability is key

Electricity is a major concern in rural India, especially for farmers. The Government of India has come up with an original plan to address this problem. Instead of transmitting electricity to the farmers, the government, to start with, wants farmers to use solar energy to power their irrigation pumps. According to the January 2018 report of the Council on Energy, Environment and Water, there are about 142,000 solar pumps in India. The government is planning to install one million solar pumps by 2021.

To achieve this, [the Union Budget 2018](#) has allocated close to 48,000 crore to set up the Kisan Urja Suraksha evam Utthaan Mahabhiyan (KUSUM). This programme will help set up more than 28 GW of combined solar capacity through these solar pumps. Additionally, to ensure optimal use of this solar energy, and to incentivise farmers to shift to renewable energy, the government plans to purchase the surplus power through electricity distribution companies. This proposal will almost certainly increase agricultural incomes and reduce electricity losses when transmitting power to remote rural areas. Analysts claim that losses from distribution could fall to about 12% from the current level of at least 23%. However, the feasibility of purchasing surplus solar power seems problematic. There is a need to address the issue of grid stability that this injection of surplus power is bound to create.

India to achieve 'electricity for all' by early 2020s: IEA

The advantage of this scheme is that transmission losses and power theft would drop significantly. Most rural retailers of power also lose money as they sell power at a subsidised rate to the poor and the farm sector. The state-run distribution companies were thus running a loss of 4.3 trillion as of September 2015. Local generation of power in the manner proposed would take care of the above issues.

We believe the disadvantages currently outweigh the advantages because of the issue of grid stability. This is an issue that is often neglected. All power grids require balancing. This balancing entails meeting the demand with adequate supply 24x7 to ensure there is no blackout. The reason for striking this balance is that electrical energy cannot readily be stored, meaning that power generation ought to work round the clock. These electrical gridlines were created to depend on reliable and controllable generators (coal, oil and even hydroelectric). However, with more and more power being generated through fluctuating power generators (solar and wind), a more precise balance will have to be created, which may cause more failures.

Take the example of solar panels that farmers use. These panels will only generate electricity during daylight hours, so to maintain a consistent round-the-clock power delivery the grid operators will need to have a back-up source of power in the form of coal or oil. During the day as well, they will have to be ready to quickly adjust output to compensate for the rise and fall of solar power generation due to changing weather and rain.

Centre's plan may boost farmers' solar power use

Output from solar panels can also change due to clouds. Variations in weather patterns make it more difficult for the grid operator to predict the balance of electrical energy that will be required to meet the demand. Because wind and solar power sources constantly generate shortfalls and excesses, the grid operators send a signal to power plants every few seconds to ensure that the total amount of power demand at the grid is consistently equal to the total power supply.

Most countries handle inputs from renewable energy sources similarly. But India is short of power.

Thus, while other nations see solar and wind power as an energy management problem, India also sees this as a capacity management problem. Because of India's sheer size, the variability factor considerably increases: if some areas have low consumption, others are likely to have high consumption. More stability can be achieved by integrating the grids into all-India grids. Expected advances in storage technology would also significantly improve grid stability.

The plan of the Government of India to purchase solar power from farmers has nevertheless taken off on a good note. In the Union Budget 2018, the Finance Minister asked governments to put in place adequate procedures to purchase the excess solar power from farmers. This sale of excess power has also discouraged overutilisation of groundwater.

However, the only problem that the government seems to be focussed on is to adequately remunerate the farmers and increase their incomes. We believe attention also ought to be provided to the stability of the grid, lest the grid network collapses due to the uncertainties of power supply and demand.

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