Rural power solutions even other States can emulate

As a recent ruling by Rajasthan's power regulator implies, enabling energy access must go beyond powering rural homes

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Over the past decade, India has made great strides in expanding energy access in rural areas. Credible estimates suggest a near doubling of electrified rural households, from 55% in 2010 to 96% in 2020 (World Bank, 2021; https://bit.ly/2UeGqpA).

However, the measure of access to power supply, has been the number of households that have been connected to the electricity grid. While this is a significant measure, it discounts large areas of essential and productive human activities such as public schools and primary health centres. And despite greater electrification, power supply is often unreliable in rural areas.

A recent ruling by Rajasthan's power regulator points to this yawning gap, but also suggests solutions that other States could emulate. The Rajasthan Electricity Regulatory Commission (RERC) has ordered the State's three power distribution companies, or discoms (the Jaipur, Ajmet and Jodhpur Vidyut Vitran Nigam Limited) to solarise unelectrified public schools. This has the potential to electrify about 1,500 government-run schools in the remote parts of the State with roof-top solar panels and generate about 15 megawatts (MW) of power. The RERC has also suggested installation of batteries to ensure storage of power.

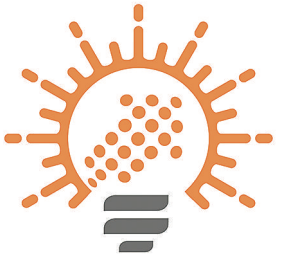
Apart from enabling education, this ruling would benefit several other crucial aspects of rural life. Government schools serve as public spaces in rural areas. They doubled up as COVID-19 care centres in the past year (https://bit.ly/367tq7V) and have housed villagers from extreme weather such as storms and floods, apart from turning into polling centres come election season.

Battery storage of power ensures that they cater to children's after-school activities. Schools could also extend power supply to mid-day meal kitchens, toilets, and motorised water pumps and not limit it to powering fans and lights in classrooms.

Clean energy drive

The RERC order also directs Rajasthan's cash-strapped discoms to seek corporate social responsibility (CSR) funds for the solarising drive and allows schools ownership of the power systems in a phased manner. This removes the burden of infrastructure development expenses on discoms, while also ensuring clean energy for the schools.

The power that is generated could also be counted towards the discoms' Renewable Purchase Obligations (RPO). RPO is the proportion of power that distribution companies must procure from renewable sources. This ratio is a gradual annual progression to encourage greater use of renewable energy and to provide for a phased manner to reduce dependence on climate warming fossil fuels.



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Achieving a target

In 2019, Rajasthan set itself an ambitious target of producing 30 GW of solar energy by 2025 (Rajasthan government, 2019). It currently has an installed capacity of about 5 GW (https://bit.ly/3ycyjIT), most of which are from large-scale utility plants, or solar parks with ground-mounted panels. The State must install at least 7 GW every year for the next four years to achieve this target. This is not impossible, but it would require investment and installation on a war footing.

While Rajasthan is India's largest State in terms of land mass with vast, sparsely populated tracts available to install solar parks, bulk infrastructure of this scale is susceptible to extreme weather events. With climate change increasing the possibility of such events, a decentralised model of power generation would prove to be more climate resilient.

Taking a cue from the RERC ruling, a greater number of public buildings could be used to install roof-top solar panels. Buildings such as primary health centres, panchayat offices, railway stations and bus stops could easily be transitioned to utilising clean energy. And with battery storage, the susceptibility of grid infrastructure to extreme weather events could be mitigated. This is called climate proofing.

For instance, the power blackout in the American State of Texas due to an extreme weather event earlier this year was caused due to inadequately climate-proofed natural gas equipment, which supplied domestic electricity. While the State's Governor Greg Abbott blamed it on frozen wind turbines and solar panels, about 70% of power that is generated in Texas is from natural gas and coal-fired power plants. Windmill power is about 20% and solar is a mere 1.1%.

Large-scale projects are generally financed by companies that wish to profit from economies of scale. They are less interested in investing in rural electricity as it is not as lucrative. Large-grid based projects add to the supply of power in urban areas, and therefore, only marginally further greater energy access goals.

As solar installations become inexpensive and with rapidly advancing battery storage technologies, decentralised solar power generation has become a reality. A State such as Rajasthan, which is most exposed to solar irradiation, could set an example by making its urban and rural centres, power generators, consumers, and suppliers in the same breath. Indeed, its government has an ambitious plan to catapult the State into being a power "exporter", but it must consider the possibility of achieving this through means that do not destroy the environment and are most productive, cost-effective, and optimal for human activity.

Working together

One of the hurdles to holistic, climate resilient, clean energy access is the lack of convergence between government departments.

In Rajasthan, for instance, the discoms could work with the State's Education Department to determine the schools that require electrification, and their expected demand and infrastructure expenses. They could then liaise with the CSR arms of companies to generate funding, and with industry to produce cost-effective solar photovoltaic panels and batteries. Sustaining these new power systems would require some unlearning and re-learning, but it is not unimaginable.

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