



Why solar microgrids are an answer to India's power woes

Praveer Sinha, Tata Power

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The potential of solar microgrids in solving India's energy security challenge, particularly in rural and other inaccessible regions, is huge.

Electricity is a key contributor to a country's economic growth and with 70% of the Indian population residing in rural villages, electrifying rural areas become immensely important. When an area is electrified, it not just lights the homes or powers the appliances but more importantly, it boosts the social and economic well-being of the entire community. It provides access to modern & efficient healthcare services, facilitates the growth of small businesses, contributes to increasing the crop yield of farmers through improved agricultural techniques, boosts the productivity of women and children through enhanced lighting post-sunset and ensures better safety for them especially at nights.

Ensuring access to affordable, reliable and modern energy for all by 2030 is also one of the key Sustainable Development Goals-SDG 7 set by the United Nations. This universal access to electricity has been the top agenda for our Government as well which has shown its continuous commitment and can be witnessed from the growth at which the villages have connected to the grid in the past 3-4 years.

Nearly 6 lakh census villages were brought under the national grid over the three years between August 2015 and April 2018. 28 April 2018 marks a remarkable date in the history of India when the country announced the connectivity of its last village - Leisang village of Manipur on the national power grid. This saw the culmination of the Rs 76,000 crore Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY), which promised to energize every village in the country and facilitated the creation of basic electricity infrastructure. Further, to intensify the electrification coverage and to ensure the last mile connectivity, the Government also launched the Saubhagya scheme in September 2017 to achieve 24x7 power for all by providing electricity connection to each household.

Though continuous measures have been taken by the Government to ensure universal electrification, the quality and reliability of power supply are still a challenge, especially in rural areas. Apart from this, it does not fully meet the requirements of commercial & industrial users. The mammoth network of grids that connect the country has served us well and to a large extent continue to do so but they come with their limitations. Besides the huge AT&C losses, theft, etc, extending these grids for ensuring last-mile connectivity in rural villages requires huge capital cost and considering the perilous financial situation of discoms, it demands innovative and sustainable solutions.

Renewable energy in today's times offer huge opportunity and does not involve the huge gestation time or fuel supply challenges as involved in the case of conventional centralized plants. Moreover, the increasing climate

change concerns and the encouraging signs of parity at a unit cost level with conventional energy sources, make renewables a preferred choice. The renewable energy sources because of its intermittent nature, when combined with storage options, offer a transformative decentralized solution especially for electrifying the rural and remote areas.

Solar microgrids - an array of photovoltaic (PV) cells that generates power and transmits to a central controller - Power Conditioning Unit (PCU) which then transmits electricity directly to homes, shops, street lights, commercial & industrial users, etc., offer an excellent solution. Further during the day, if the power generated is not used or surplus power is generated, the power controlling unit directs this to the battery bank which stores power for further usage post-sunset. A micro-grid is much cheaper and quicker to deploy and can range from as small as 30 kW to a 1 MW system.

It offers a great substitute to other off-grid sources like diesel which powers more than 40% of rural enterprises, especially the commercial & industrial users, in states like Bihar and Uttar Pradesh. The diesel apart from being frightfully expensive contributes to polluting the surrounding areas as well. In terms of technological systems, the micro-grids on account of advancements in energy management solutions, remote monitoring, smart meters, etc. are using some state-of-the-art solutions for control and monitoring purposes. There is a huge opportunity for utilities, investors, technology providers, etc. to collaborate and scale this low-carbon, sustainable and decentralized energy solution, impacting the lives of millions of people.

As India's leading integrated utility and a leader in renewable energy Tata Power through TP Renewable Microgrid in collaboration with The Rockefeller Foundation plans to set up 10,000 microgrids over the next six years to provide power to millions across India and help eradicate energy poverty. When this plan is fully executed it will power 5 million households with electricity and positively impact 25 million lives. Further easy access to power is also expected to create 10,000 new green jobs and support 100,000 rural enterprises and deliver irrigation to 400,000 local farmers while supplying potable water to their communities. The positive environmental outcome is also immense. The 10,000 microgrids when fully implemented, will cut yearly carbon dioxide emissions by 1 million tonnes and save 57 million liters of diesel annually.

For the first time in Independent India, we have a sustainable solution to solve our energy security challenge in the form of solar micro-grids. The symbiotic advantages of political will working with the technology and capital from the private sector can now truly transform India's rural landscape for good.

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About Praveer Sinha

Praveer Sinha is the Managing Director and Chief Executive Officer of Tata Power. He has over three decades of experience in the power sector including setting up greenfield and brownfield power plants in India and abroad. Sinha holds a Master's Degree in Business Law from National Law School, Bengaluru and is an Electrical Engineer by training.