Beyond just lighting, with nanogrids in the hinterland

Sun Moksha finds a cloud based solution for powering rural lives

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The applause continued long after Ashok Das wound up his presentation. The audience that listened to Das, founder CEO of Bengaluru-based firm Sun Moksha that offers clean technology solutions, included Uttar Pradesh Chief Minister Yogi Adityanath, a galaxy of successful new-gen entrepreneurs and angel investors from the corporate world.

The mild-mannered, diminutive Das was at his alma mater — Indian Institute of Technology (IIT) Kanpur — to talk about key interventions his team has been making in the Indian hinterland. "We want to use smart technologies to help those living in remote villages move up in socio-economic status," Das, a PhD in mechanical engineering from the University of Southern California, recently told a start-up conclave, Startup Master Class, organised by IIT Kanpur Alumni.

Das, who returned to India in the late 2000s after an 18-year stint abroad, is already walking the talk. Two years ago, his firm installed India's first village smart nanogrid in Chhotkei, a remote Odisha village around 160 km from Bhubaneshwar.

The Smart NanoGrid that the Bengaluru-based firm has developed is not a mere energy access system. It is meant for integration and comprehensive management of diverse resources such as energy, water, air, agriculture and micro-enterprises in a single platform. It consists of an energy generation unit from hybrid renewable resources (such as solar, wind, biomass) with or without grid power; a smart grid to distribute energy to consumers; a remote management system based on the cloud to manage operations, maintenance and remote monitoring.

The nanogrid can incorporate other resources in addition to energy, such as water quality and consumption, soil quality for agriculture, waste water, air quality and asset management for equipment and machines. "Before we started working in Chhotkei, a village of 140 houses not connected to the grid, the people had very little idea what all they can do with electricity other than perhaps lighting and entertainment," recalled Das. Today, streetlights switch on automatically when darkness falls. There are new ventures — micro-enterprises and other business units — running on electricity. As electricity is available for irrigation, farmers in the village grow not one, but three crops. "And the grid is not manned by an engineer, but by someone who is '8th pass'. A village committee decides how much to charge consumers. While micro-enterprises and other ventures like workshops receive power during the day, houses get it during the night," the CEO said.

More importantly, the Sun Moksha team has designed the nanogrid in such a manner that the capital cost of the grid came down by one-third. "The efficient distribution and rationing of power ensured that the entire village require just a solar plant of 30 kWp capacity. In normal course, providing that much power would have required a plant of 45 kWp capacity, this not only saved solar cell-cost, but also on an energy storage system."

It has also factored in the need for additional power as people's aspirations grow. "We are identifying an area in the village where we can have a plantation of fast-growing trees, which can be then used for running a biomass plant."

The second village that the company worked in was in Jharkhand. "Our model was slightly different there as the State Government was willing to give us grid power. Our job was just to efficiently distribute the power using a smart distribution system and find means for providing power backup when regular power was not there," Das explained.

The success of these projects has attracted a lot of attention. Currently, the firm is providing technical guidance and consultancy to a foundation which is electrifying 100 villages in UP. Similarly, a mining company in Odisha wants it to explore erecting such smart nanogrids in 200 villages in and around their mine. But there is nothing concrete yet. The UP government too wants them to do some pilot projects in a few villages.

"My goal is to create such smart nanogrids in 10,000 Indian villages," Das signed off.

With the sun as partner Chhotkei village sees an energy boost; (right) Ashok Das, founder and CEO, Sun Moksha