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SunMoksha's Smart Nanogrid™ Is Electrifying One Indian Village At A Time

[Chrisanta Dias](#) June 15, 2016 [Features](#) [Leave a comment](#)

Chhotkei is a small village in Odisha surrounded by the hilly and scenic terrain of Satkosia Tiger Reserve, about 160km from the state capital, Bhubaneswar. After spending years in darkness, Chhotkei is also India's first Smart Grid Village with a 30kWp solar-powered Smart Nanogrid™ that meets the energy demands of 140 households, 20 streetlights, a temple, and three community centers. This Smart Nanogrid™ has been implemented by SunMoksha with financial support from Wartsila India and under the guidance of Odisha Renewable Energy Authority (OREDA). It is now locally managed by the village youth who have been trained by SunMoksha at the Living Laboratory at National Institute of Science and Technology (NIST), in Berhampur, Odisha, where the R&D for Smart Nanogrid™ was also conducted.



Solar panels in Chhotkei village

Founded by Dr. Ashok Das, [SunMoksha](#) provides sustainable solutions for rural development, as well as for urban sustainability. It has developed Smart Remote Management Solutions to manage energy, water, air, waste, processes, and other resources for villages, cities/townships, industries, institutions, and individuals. However, for the rural market, SunMoksha has developed a holistic solution, Smart NanoPower, to address the challenges of rural electrification. The key technical intervention is the Smart Nanogrid™ powered by a cloud-based SaaS solution “NanoSoft Remote” – a state-of-the-art comprehensive solution to manage the entire operations of the micro-grid.



Dr. Ashok Das (1st from left) and the SunMoksha team receiving the Smart Cities India award SunMoksha's [Smart Nanogrid](#)™ at Chhotkei, won the 2016 Smart Cities India Awards under the category of Smart Village, on May 13th, at the Smart Cities India expo. This award has been a validation by experts of SunMoksha's solution to make villages energy efficient and self-reliant. Dr. Das says,

Our solutions are based on two key interventions – renewable energy and smart microgrid with remote monitoring. Both of these are significant for the development of this sector. The second component has been missing from the village microgrids and now everyone is talking about it.”

The Smart Nanogrid™ is SunMoksha's flagship solution for comprehensive management, maintenance and remote monitoring of mini-, micro- and nano-grids for sustainable development of communities. It comprehensively integrates and manages diverse resources such as energy, water, air, agriculture, equipment, etc., into a single open source platform, thus helping communities become self-reliant by managing these optimally.



Village youth operating the Smart Nanogrid™

In [Chhotkei](#), the Smart Nanogrid is hosted on a local server from where operators can manage metering, billing, tariffs and alerts. This is the energy hub from where consumption is managed; if a consumer exceeds the maximum power allocated, the system automatically shuts off power to that consumer. Villagers who use smartphones are provided information about their consumption, billing, payment, etc. on their devices; whereas others are provided with energy cards which have embedded codes. These cards can be scanned at the powerplant in order to obtain similar consumption and billing information. This brings efficiency and transparency in operations, with data available at the finger-tips.

The Smart Nanogrid™ has been fully functional in Chhotkei only since February 2016 but has brought with it significant changes to the lives and livelihood of the community since then. Dr. Das believes the village is witnessing a transformational journey which will unfold over the months and years to come. He adds,

Children have started to study in the evening, women and adults have access to light and entertainment, and most importantly, farmers and youth have access to opportunities. Street lights have enabled social interactions and fearless strolls through the village streets and pathways in this tiger reserve. Irrigation pumps and micro-enterprises are being set-up.”

SunMoksha was born out of Dr. Das' desire to do something for his own village. He comes from a village in Bihar and left it when he was young to pursue studies at IIT Kanpur, followed by a PhD at the University of Southern California during which period he also worked with a clean tech company on converting waste to energy. Post his doctorate he worked for 10 years at Applied Materials. He then decided to come back to his roots and started SunMoksha in 2008 while simultaneously building an ecosystem in the clean energy space in various roles – TiE Bangalore charter member establishing and chairing Clean Tech India Forum, consulting on various projects for the World Bank, ADB, KfW, UK-DfID and other international development organisations as well as managing Desi Power's rural electrification programme for a year.

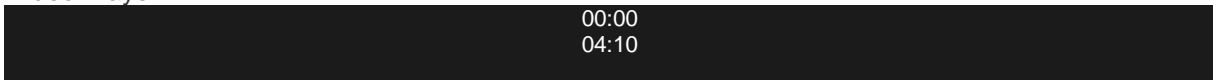
Solution Development at *Living Laboratory* at



SunMoksha's Smart green campus

It was in the latter role that he fully understood India's acute need for power and the disillusioning darkness that most of rural India lives in. Harnessing all of his experiences, he worked with the faculty and students at the NIST in Odisha to create a solution. The institute served as a Living Laboratory to develop and test various solutions leading to the creation of Smart Nanogrid™.

Video Player



Following the success at Chhotkei, India's Energy Ministry has approved several pilots to replicate Chhotkei across the country. The state government has asked him to implement his solutions where basic infrastructure has been provided but is in a state of disrepair after overuse and abuse. While he is happy to do so, Dr. Das firmly believes that micro enterprises are the way forward as they empower people and move them up the socio-economic development path. He says,

*Sustainable energy is the only way forward for India. And micro-grids are the best way for reliable, predictable power supply. Inspired by the success of microgrids operating across the country, government is accelerating its efforts in micro/mini-grids, and has put up the new **policy** for public comments. I think we are on the right path."*

Dr. Das also opines that while a lot has been done in the smart microgrid space, these are mostly for smart cities driven by large commercial gains. Whereas, more needs to be done for villages and rural areas where the need is greater but commercial gains are smaller due to smaller distributed deployments. He is also working on dissemination of information so the gains from adopting microgrids multiply manifold. To this end, Dr. Das has received assurance from Climate Parliament to take it across the globe. Meanwhile he and SunMoksha continue to work with those who are looking

to leverage his experience with microgrids as he believes, "Electricity is not just for lighting. It is for empowerment."