

How solar power is turning rural India bright and shining

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Welcome change Solar lighting not only provides a high quality solution to improve rural productivity, but also substantially reduces health hazards by enabling replacement of kerosene lamps

RV Moorthy

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Solar will enhance livelihood prospects, improve efficiency in rural households

As the Indian economy enjoys a sustained positive momentum, rural India continues to be the heart of the country, accounting for 67 per cent of the total population and 37 per cent of its GDP.

Agriculture is the primary occupation of rural households and mainstay of their socio-economic structure. While the overall Indian economy is expected to grow in excess of 7 per cent – the fastest amongst large global economies – rural India still lags behind substantially.

The primary hindrance to growth in rural productivity and subsequent economic growth, is the lack of basic infrastructure such as electricity, clean water and sanitation.

Huge opportunity

Nearly 300 million people in rural India lack access to grid-connected power, promoting use of archaic sources of energy such as kerosene, diesel, wood-fired *chulhas*, etc, which not only results in huge government subsidies, but also substantial health and environmental hazards.

Solar power offers an opportunity to bridge this massive infrastructure gap and improve the social, economic, environment and health indicators of 30 per cent of India's population.

While solar power has been around for a while, historically high costs have necessitated it to be driven by philanthropic capital or government subsidy, thus limiting its scope.

However with a drop in capital cost by nearly 70 per cent over the last four years, solar energy has now become commercially mainstream, thus attracting private capital and entrepreneurs.

This truly makes solar power the much awaited panacea for the millions living in darkness.

Further, the Centre, under the leadership of Prime Minister Narendra Modi, has strongly supported solar power.

As part of the government's vision of 'Electricity for all by 2019', the Centre has placed special emphasis on incentivising distributed solar power, having already sanctioned 4,604 distributed solar project in rural area to power 4,745 villages/hamlets.

Lighting up rural India

The decentralised and modular nature of solar power makes it easy to deploy for multiple rural applications, impacting key facets of rural population such as productivity, safety, health benefits, access to clean water, heating solution and livelihood.

Solar lighting, for example, not only provides a high quality solution to improve rural productivity, but also substantially reduces health hazards by enabling replacement of kerosene lamps. Even 4-5 hours of additional lighting can improve productivity and income of rural household by nearly 30 per cent.

Nearly 3.5 million solar lighting solutions have been installed till date, making it a \$200-million market in FY 15.

While historically these systems were funded by government-backed programs, of late most products are sold on a commercial basis, backed by financing support from MFIs/cooperative banks.

Private players like Jain Irrigation, **Tata Solar**, Greenlight Planet, etc, now dominate the market. Recent venture capital funding of \$10 million in Greenlight Planet by Fidelity Growth Partners truly underlines the economic viability of this model.

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Solar micro and mini grid are logical extensions of standalone solar lighting solutions as they have the capability to provide incremental benefits to households like powering fans, mobile charging, community television, as well as facilitating Internet access etc.

Simpa Networks is an excellent example of a private enterprise providing commercially viable micro grid solution to the poorest of poor districts – it has provided pay per use solutions to eight districts in UP, thus lighting nearly 15,000 homes.

Simpa Network is backed by commercial and developmental institutions like ADB, OPIC, GDF Suez, etc, and has funding in place to provide solutions to additional 75,000 users.

A unique variant of this model is a mini grid solution by private players like OMC power, which use a solar telecom tower as the primary base load and supply excess power to rural households on a pay per use basis.

Smarter farming

Another important application is solar powered agri pumps, which have the potential to substantially improve productivity of Indian farmers. Solar agri pumps are an economic and environmentally-friendly alternative to nearly 26 million agri pumps installed in India, of which 10 million are diesel-fired.

Replacement of 1 million diesel pumps could, over its life, improve agricultural output by ₹30,000 crore, mitigate usage of diesel by 9.4 billion litres – translating into a reduction of diesel subsidy by ₹84,000 million and CO₂ abatement of 25.3 million tonnes.

While solar pumps cost nearly 10 times more upfront than the diesel variants, they have attractive payback period of 4 years vis-a-vis diesel pumps. Central and State governments have introduced multiple favourable schemes to promote usage of solar pumps, by providing subsidy for the upfront costs.

Possible applications

Clean water remains a big challenge in rural India, since water treatment requires power.

Solar energy is finding important applications in this field. For example, Nagaland recently installed a solar powered water treatment plant in Tsiesma, a village near Kohima, which works on an advanced membrane filtration system producing pure drinking water.

Other important applications of solar power include access to the Internet and television, which can enhance – rural employment, solar-powered basic healthcare centres, solar-powered tablets like those developed by edZilla (which is transforming the scene of education in rural Karnataka), and solar telecom towers, which have the potential to provide economic and hassle-free solutions to nearly 150,000 telecom towers plagued by unreliable energy supply.

Last but not the least, solar energy also provides a multiplier effect by providing employment and entrepreneurial avenues to rural youth. Given the simple and modular nature of solar systems, large number of semi skilled labourers in rural India can be employed for installation and after sales services of these systems.

It is evident that adoption of solar power as an alternative source of energy could alter the socio-economic fabric of rural India, for the better.

Centre's role

The Centre, as always, has a key role to play in expediting this process. It must develop new and affordable sources of solar energy, besides educating the rural masses about the benefits of switching to solar.

However, the private sector must step in and complement the State's initiatives and the governments must create a climate conducive for private capital inflow to this sector.

The heightened sensitivity about solar energy is heartening to see and if this pace is maintained, rural India is indeed headed for 'sunny days'.

The writer is Senior Managing Director (Investment Banking) of YES Securities, and Distinguished Fellow (Sustainable Investment Banking) of YES Institute