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Solar power on every rooftop

A solar panel atop every house should be the model for providing electricity to all. The grid should merely serve as a back-up.

Mahesh P. Bhave
Debashis Chatterjee

The aim should be personal power just as we have personal computers. — M.A. Sriram

With will and vision, India's energy prospects can be changed from grim to green, and the world will benefit as a result.

The failure of the country's electricity grid on July 30 and 31 highlights its vulnerabilities and underscores a larger national need: about 400 million Indians are not connected to the grid at all, and those who are have unreliable access. At 571 kWh per capita, India's electricity consumption is one-fifth of China's (2,631 kWh) and less than one-twentieth of the US' (12,914 kWh). India's electricity demand will only grow.

Burning coal for electricity is increasingly expensive, causes global warming, and jeopardises the planet's health. In any case, India has ash-rich coal, limited oil, unknown amounts of gas, poor mining productivity and inadequate transport. Power plants struggle to get reliable fuel supplies. Solar electricity today at Rs 7.50 a kWh is economical compared with subsidised diesel-generated power at roughly Rs 15 a unit, but more expensive than coal-based electricity at about Rs 6. What, however, is the true cost of coal-based power? Prices are distorted by subsidies, State boundaries, vote-bank politics, and uncharged carbon-emission costs. Average prices matter less than peak prices. When India sheds load to manage peaks, customers use expensive diesel power.

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How do we come out of this energy and infrastructure bind? Nothing short of a fundamental re-imagining, starting from first principles, of all energy solutions is essential to address India's energy needs. Can India leapfrog into a clean-energy future rather than extend the conventional grid with fossil fuels at its core? In a nation blessed with abundant sunlight, to what extent should electricity be a networking service at all? Could India tap ambient solar energy for most of its needs?

India's single-minded focus should be massive and rapid solar deployment, not only through utility-scale solar plants, but also through distributed generation, household-by-household, nationwide. Electricity in Indian homes should be rooftop-to-room and solar based with energy self-sufficiency as the goal; the grid can complement and serve as back-up where available. Much as TV antennas once sprouted on rooftops, so should solar panels.

Public policy should have a singular aim: universal electricity access.

By implication, policies aimed at encouraging domestic manufacturing, local content requirements, or favouring one technology over another should be put aside as tertiary.

The aim should be personal power just as we have personal computers. Slowly, we will get there. In the meanwhile, solar electricity is poised to become a friendly, industrial scale, cottage industry, like vegetable patches in home gardens. Photovoltaic technologies have matured sufficiently and present us with simple, affordable electricity alternatives to the traditional grid.

Enabling public policy can unfetter entrepreneurial energies and give birth to millions of small and large solar-related businesses, and thereby generate employment. Distributed solar generation can spawn innovations. Standardised 1-kW solar kits, for instance, can be mass produced and installed easily. The household deployments can extend to communities and neighbourhoods resulting in self-sufficient micro-grids.

PARTNERSHIP WITH CHINA

Community micro-grids for tens and hundreds of households in villages, towns and cities should be India's preferred electricity infrastructure. Anchored with solar, the solutions may include combinations with bio-diesel, batteries, wind, biogas, micro-hydro, etc. At night or when the sun is behind clouds, alternative yet local sources can assure electricity. Once solar energy takes root, India will need less of the colossal and wasteful transmission, distribution and generation infrastructure except for industrial operations such as running factories and trains.

China has recognised the importance of solar energy and invested in numerous solar-panel factories. Taiwan is doing the same. Due to the manufacturing excess, prices have dropped by over 70 per cent in the past three years, and the fall continues. India presents a ready market for that production. The formula, 'China produces, India deploys', makes for a winning partnership.

MORAL IMPERATIVE

Among competing national priorities, what can be more catalytic of overall welfare than universal electricity? It can extend working hours, reduce pollution and diseases, and help prevent food waste. Beyond lighting homes, solar solutions allow for the spread of the Internet and therefore education, e-governance kiosks and ATM machines.

Solar panels facilitate a parallel infrastructure for clean transport — charging batteries for electric bicycles, scooters and cars. Solar energy aids cooking, powers streetlights, operates irrigation pump sets and substitutes diesel burning for cellular towers. Stubborn problems such as efficient battery storage persist, but they can be dealt with as the market evolves.

The grid failure has crystallized the solar market. There has never been an India-sized market for solar electricity, with relentlessly rising demand, talented people, old infrastructure and plentiful sunlight. The scale can establish new low-price benchmarks and thereby aid the entire world. Unfavourable economics has been the primary barrier to the spread of solar energy until recently, but no longer.

Universal electrification is a human-rights, inter-generational-justice and human-capital-growth issue all in one. For how many decades should a third of India's citizens use kerosene for light and cooking, children study by smoky, unhealthy flames, and income-earning opportunities fade with sunset?

(Mahesh Bhave is Visiting Professor, Strategy, and Debashis Chatterjee Director, IIM Kozhikode.)