

Solar power lights up lives of Indian rural poor

KATY DAIGLE - Associated Press - Associated Press

Boommi Gowda used to fear the night. Her 70-year-old vision fogged by glaucoma, she could not see by just the dim glow of a kerosene lamp and so avoided going outside where king cobras slithered freely and tigers carried off the neighborhood dogs.

But things have changed at Gowda's home in the remote southern Indian village of Nada, thanks to a solar-powered lamp pouring white light across the front of the mud-walled hut she shares with her three grown children, a puppy and a newborn calf.

"I can see!" Gowda said, giggling through a 100-watt smile as she surveyed the Spartan hut painted black to ward off termites. Under a new LED bulb, her daughter worked her job rolling Indian cigarettes, or bidis, while her son sat smoking one of them nearby. Gowda has lived her entire life here, a kilometer (half-mile) walk through rice fields, vegetable gardens and jungle overgrowth to the nearest road. She had never had electricity before.

"Life is improving," the frail woman said. "Look, we have light. I am happy!"

Across India, thousands of homes are receiving their first light through myriad small companies and aid programs that are bypassing the central electricity grid to deliver high-tech solar panels to the rural poor.

Despite decades of robust economic growth, at least 300 million Indians — a quarter of the 1.2 billion population — still have no access to electricity at home.

They have been left to rely on yesterday's fuels, including cow dung and more commonly kerosene, paying premium black-market prices when government supplies run out. They scurry during daylight to finish housework and school lessons. They wait patiently for grid connections that often never come.

Next door to the Gowdas, 58-year-old Leerama, who goes by one name, wore a grimace as she watched her neighbors light their home for the first time. She said her family would wait for the grid, insisting they were entitled to it and pointing to electrical wiring dangling uselessly from her walls. But as her 16-year-old son interrupted to complain he was struggling in school because he cannot study at night like his classmates, Leerama relented.

"We are very much frustrated," she said. "The children are very anxious. They ask every day 'Why don't we have power like other people?' So if the grid doesn't come in a month, maybe we will get solar, too."

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These two families, living on the outskirts of the west coast port of Mangalore in the southern state of Karnataka, are among many in India who are increasingly looking for solar solutions to power them into modernity.

For them, going solar has nothing to do with India's green ambitions or helping to lower carbon footprints to stem the trend in climate change. It has nothing to do with ensuring India's future energy supply to support continued development.

For them, it is simply a matter of security and ease, of being able to cook by light, read a newspaper, listen to the radio or earn a little extra by working after dark. It's about warding off nighttime predators and helping the children excel in school. It is about finally being able to use coveted items like televisions and kitchen mixers.

Experts say these customers, who live day-by-day on wage labor and what they harvest from the land, will be the key to fueling a solar boom in the next decade, as solar technology presents an elegant and immediate solution to powering everything from light bulbs and heaters to water purifiers and agricultural pumps.

"Their frustration is part of our motivation. Why are we so arrogant in deciding what the poor need and when they should get it?" said Harish Hande, whose Selco Solar Light Pvt. Ltd. is owned by three foreign aid organizations and so far has fitted solar panels to 125,000 rural Karnataka homes, including the Gowdas'. "If they were not frustrated with the energy situation, there would be no need for us. It makes things interesting, to prove this can be done."

It is not an easy task. Their low-income customers need help with everything from setting up their first bank accounts and negotiating loans to navigating the fine print of payment contracts. To find new clients, agents must go door-to-door in remote settlements, sometimes crossing rivers, hiking mountains or wading through wetlands to reach them.

But the sales pitch leads to reliable profits. Solar panels take little space on a rooftop; the lights burn brighter than kerosene lamps, and do not start forest fires or get snuffed out by strong winds. Unlike central power, solar power units do not get rationed or cut.

The prices, still higher than for grid electricity, are already economical for those off the grid. A Selco single-panel solar system goes for about \$360, the same or less than a year's supply of black-market kerosene.

"We are a for-profit company, but a company with a heart," said Anand Narayan, head of Selco's lab division, which works out solutions for the poor, from solar-powered cooking stoves and sewing machines to flexible financing deals with banks. "Giving things away has its moral hazards. People take things they don't need."

Boommi Gowda's family signed up for its solar system within weeks of seeing one at the home of neighbor Babu Gowda, who is not related but shares the common

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regional last name.

"With kerosene, you have to carry the lamp around wherever you go. The light is dim, and smoke fills the room and spoils the paint," the sprightly 59-year-old said. He finally decided on solar after losing his dog to a tiger from the neighboring national park. "I kept waiting and thinking the grid would come, and after years I was angry. But now I'm thrilled. Now we have light. We can move on, maybe expand with another solar panel and get a TV."

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What's predicted for India's solar market is not unlike the recent explosion in cell phones, as villagers and slum-dwellers alike embraced mobile technology over lumbering land-line connections; there is now at least one mobile phone link for every two people in the country.

The government, delighted that off-grid solar programs are giving light to India's impoverished, has pushed for upstart manufacturers and entrepreneurs to seize the opportunity. Its 2009 solar mission — a \$19 billion plan of credits, consumer subsidies and industry tax breaks to encourage investment — is fast becoming a centerpiece of its wider goal for renewable sources, including wind and small hydropower, to make up 20 percent of India's supply within nine years. Solar alone would provide 6 percent — a huge leap from today, when it makes up less than 1 percent of the 17 gigawatts India gets from renewables.

Already dozens of small solar firms, both Indian and foreign, as well as aid groups are shopping the solar solution to the millions still in darkness.

Near Nada, within Karnataka's district of Belthangady, schools send students home with solar-charged flashlights to study at night, and the temple town of Dharmasthala, visited by 10,000 pilgrims a day, offers free water purified through solar filtration.

Another Hindu temple in the northern state of Andhra Pradesh boasts one of the world's largest solar-powered steam kitchens, preparing 30,000 meals a day, while western Gujarat has experimented with a solar crematorium. Even in the northeast Himalayan frontier state of Arunachal Pradesh, where the sunshine is not India's brightest, Buddhist monks have installed solar panels to heat water at their 330-year-old Tawang Monastery.

Solar panels are becoming a must-have luxury item on dowry lists, even for those who have electricity but are annoyed by power cuts. The capital, Delhi, requires hotels, hospitals and banquet halls to have solar water-heating systems, while officials discuss solar power for cell-phone towers.

The federal government leads a massive campaign titled "Light a Billion Lives" to distribute 200 million solar-powered lanterns to rural homes, while also supporting the creation of so-called "solar cities" — with self-contained micro-grids — in areas where supply is short.

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Even Tata Power, India's energy giant and main supplier of coal-sourced grid power, is eyeing the off-grid market while it plans large solar and wind installations to feed into the network.

"Decentralized and distributed power from renewables is where we see a lot of growth. There are many suitable technologies. All that's needed are entrepreneurs," Tata's chief sustainability officer Avinash Patkar said.

The biggest stakeholder in India's solar success is the government, which is desperate to expand its energy options as its fast-moving economy faces chronic electricity shortages. Last year's 10 percent shortfall is expected to increase to 16 percent this year, according to the Central Electricity Authority. Within 25 years India must quintuple electricity production to meet its needs, the World Bank says.

India is fast building more coal-firing plants and planning new nuclear plants, despite public worries about safety after this year's Japanese nuclear disaster.

But the reliance on coal — accounting for 55 percent of today's supply — has India in a bind. India is the world's fourth-largest carbon emitter and is under pressure to abandon fossil fuels. Its coal will run out within decades, leaving it dependent on a volatile global market.

Given such pressures, India has seized a global leadership position in wind technology and now, with its two-track promotion of both grid and off-grid solar power, it has been named the world's No. 3 most attractive destination for renewable energy investment, after the U.S. and China, according to two separate reports by global consulting firms KPMG and Ernst & Young.

Investors in both major grid installations and decentralized rural options are being lured by India's rapid development, making it ripe for innovation and new infrastructure. They're encouraged by the government's market incentives, the 30 percent consumer subsidies.

And when it comes to sunshine and land, India is downright rich. Western states like Gujarat and Rajasthan get the full brunt of the sun on deserts and sand dunes that are luring big projects for solar fields to plug into the grid.

But most new grid capacity will be sucked up by industry, leaving little for the poor who live in off-grid desert outcrops, mountain hamlets and jungle villages like Nada. As a result, off-grid solutions are now seen as a necessary part of the country's development.

U.N. Environment Program chief Achim Steiner assured industrialists in New Delhi last month of "enormous potential for India to catalyze and to champion sustainable development" while improving social equality.

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In two years, the government hopes the off-grid solar yield will quadruple to deliver 200 megawatts — supplying some 40,000 homes or farms.

With 40 percent of rural households lacking electricity and nearly a third of India's 30 million agricultural water pumps running on subsidized diesel, "there is a huge market and a lot of potential," said executive director Santosh Kamath of KPMG in India, and author of its report on India's solar market. "Decentralized solar installations are going to take off in a very big way and will probably be larger than the grid-connected segment."

What's good news for solar business is great news for families like P.N. Babu's. The 51-year-old laborer, who supplements his daily labor wages by tapping sap from rubber trees, has raised his three children without electricity, finally giving up on the grid's awaited arrival when he saw his 14-year-old son's eyes tearing as he tried to read by lamp.

"My children are too important. Solar is a good deal. It's either this or nothing, right?" Babu said as the sun set. Normally, it is so dark not even moonlight cuts through the dense canopy of palms overhead. But on their first day with solar electricity the house was ablaze.

The family took turns praying, elated they could see the Hindu icons of Lords Krishna and Ganesh by the light. Babu's son Suresh, who is practicing art during his school's summer break, grabbed his sketchbook filled with fanciful drawings of tigers, hippos, flowers and water jugs and opened to a blank page. Quickly, he outlined a modest house like their own, complete with a neatly swept yard and jungle gardens growing wild.

"When school starts again, I am ready now to get high scores. I couldn't see the words in the book before, with the smoke and the tears," he said, using his pencil to fill the borders with jungle growth. "This light is good, it is bright. I am drawing fast." He finished the picture with the small box of a solar panel atop the roof.

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