

# Sunny days ahead for solar power

Solar power is a clean energy source. But in the arid part of northwest India it can also be a dusty one. Every five days or so, in a marriage of low and high tech, field hands with long-handled dust mops wipe down each of the 36,000 solar panels at a 63-acre installation operated by Azure Power. The site is one of the biggest examples of India's ambitious plan to use solar energy to help modernise its notoriously underpowered national electricity grid and reduce its dependence on coal-fired power plants.

Azure Power has a contract to provide solar-generated electricity to a State-government electric utility. Inderpreet Wadhwa, Azure's chief executive, predicted that within a few years solar power would be competitive in price with conventionally generated electricity.

“The efficiency of solar technology will continue to increase, and with the increasing demand in solar energy, cost will continue to decrease,” Mr. Wadhwa said.

## Setting the target

Two years ago, Indian policymakers said that by the year 2020 they would drastically increase the nation's use of solar power from virtually nothing to 20,000 megawatts enough electricity to power the equivalent of 20 million modern U.S. homes. Many analysts said it could not be done. But, now the doubters are taking back their words.

Dozens of developers like Azure, because of aggressive government subsidies and a large drop in the global price of solar panels, are covering the north-western plains including this village of 2,000 people with gleaming solar panels.

So far, India uses only about 140 megawatts, including 10 megawatts used by the Azure installation, which can provide enough power to serve a town of 50,000 people, according to the company. But analysts say the national 20,000 megawatt goal is achievable, and India could reach those numbers even a few years before 2020.

“Prices came down and suddenly things were possible that didn't seem possible,” said Tobias Engelmeier, managing director of Bridge to India, a research and consulting firm based in New Delhi.

Chinese manufacturers like Suntech Power and Yingli Green Energy helped drive the drop in solar-panel costs. The firms aggressively increased production of the panels and cut costs this year by about 30 per cent to 40 per cent, to less than \$1 a watt.

Developers of solar farms in India, however, have shown a preference for the more advanced, so-called thin-film solar cells offered by suppliers in the United States, Taiwan and Europe. The leading U.S. provider to India is First Solar, based in Tempe, Arizona.

India does not have a large solar manufacturing industry, but is trying to develop one, and China is showing a new interest in India's growing demand. China's Suntech Power sold the panels used at the Azure installation, which opened in June. Industry executives credit government policies with India's solar boom, unusual praise because businesses usually deride Indian regulations as Kafkaesque.

### **Opening up**

Over the last decade, India has opened the state-dominated power-generating industry to private players, while leaving transmission, distribution and rate-setting largely in government hands. European countries heavily subsidise expensive solar power by agreeing to buy it for decades at a time, but the subsidies in India are much lower and solar operators are forced into greater competition, helping push down costs.

This month, the government held its second auction to determine the price at which its state-owned power trading company NTPC Vidyut Vyapar Nigam would buy solar-generated electricity for the national grid. The average winning bid was Rs.8.77 (16.5 cents) per kilowatt hour.

That is about twice the price of coal-generated power, but it was about 27 per cent lower than the winning bids at the first auction held a year ago. Germany, the world's biggest solar-power user, pays about 17.94 euro cents (23 U.S. cents) per kilowatt hour.

India, to be sure, still significantly lags behind European countries in the use of solar. Germany, for example, had 17,000 megawatts of solar-power capacity at the end of 2010. But India, which gets more than 300 days of sunlight a year, is a far more suitable place to generate solar power. And being behind is now benefiting

India, as panel prices plummet, enabling it to spend far less to set up solar farms than countries that pioneered the technology.

### **Eye on future**

In its solar-power auctions, moreover, NTPC is not creating open-ended contracts. The last auction, for example, was for a total of only 350 megawatts, which will cap the government's costs. The assumption is that the price of solar power will continue to decline, eventually approaching the cost of electricity generated through conventional methods.

Most Indian power plants are fuelled by coal and generate electricity at about four rupees per kilowatt hour. Yet, even in this month's auction, the recent winning bids were already comparable to what India's industrial and commercial users actually pay for electricity — from eight to 10 rupees. And solar's costs are competitive with power plants and back-up generators that burn petroleum-based fuels, whose electricity costs about Rs.10 per kilowatt hour.

“At least during daytime, photovoltaic panels will compete with oil-generated electricity more than anything else” in India, said Cedric Philibert, a senior analyst at the International Energy Agency in Paris. “This comparison is becoming better and better every month.”

In addition to the federal government, several of India's states like Gujarat, where Khadoda is located, are also buying power at subsidised rates from solar companies like Azure Power.

Analysts do not expect India's solar rollout to be problem-free. They say some developers have probably bid too aggressively in the federal auctions and may not be able to build their plants fast enough or at low enough cost to survive.

Consequently, or because their bids were merely speculative, some developers are trying to sell their government power agreements to third parties, analysts say, even though such flipping is against the auction rules.

Mr. Wadhwa, of Azure Power, said that a solar-industry shakeout in India was almost inevitable. “Initially, a lot of new players enter the sector,” he said, “and then the market settles with a few players who have a long-term” commitment to the industry (The Hindu 30-12-11).