HIGH OPERATING COSTS BURN UP SOLAR UNITS' FUNDS
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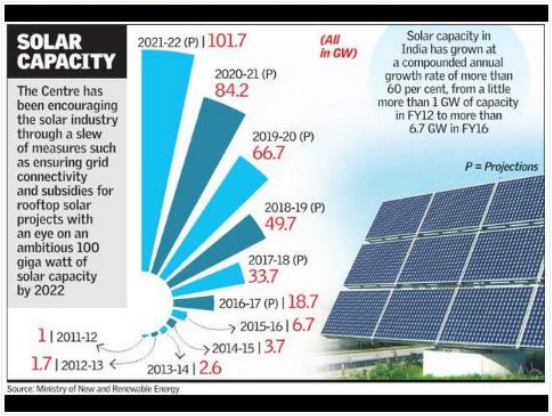

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Dust, lack of skilled workforce, dearth of water and high temperatures – all contribute to extra costs of maintenance.

Dust, high temperatures and the dearth of water are contributing to a significant increase in the cost of operating solar power plants in the country, according to industry leaders.

Some of these factors, such as the level of dust particles and the type of dust, vary from region to region within the country, while other factors such as the hardness of the water and the shortage of a skilled labour force are more general problems faced by plants across the country.

Too hot

"The solar panels that are used are not designed for such high temperatures," Tata Power Solar Systems CEO and Executive Director Ashish Khanna said. "In remote areas with high temperatures, we find that we are not getting the required units of power. The panels do not yield their optimal usage."

India ranks among the highest in the world in terms of solar irradiation with an average reading of 5.1 kilowatt hours (KwH) per square metre, according to CARE Credit Research. This is higher than Germany (2.9 KwH), Japan (3.65 KwH), the US (4.7 KwH) and Italy (3.8 KwH), all of which have a larger solar installed capacity than India.

While the Centre has been encouraging the solar industry through a slew of measures such as ensuring grid connectivity and subsidies for rooftop solar projects, and with an eye on an ambitious 100 GW of solar capacity by 2022, the findings of the industry's initial producers could lead to more interventions to address problems encountered so far.

"Dust is a problem, especially in Rajasthan, where the dust conditions are really bad and require frequent cleaning around two times a month, which then increases our operational costs," Ketan Mehta, CEO of Rays Power Infra, which has about 1,800 MW of plants across eight states in the country, said.

The cleaning cost is about Rs.2 per module, Mr. Mehta added. "In Andhra Pradesh and Telangana, for example, we need to clean once a month, but in Rajasthan we need to clean the modules twice a month. So that doubles the cleaning cost."

"There are different types of dust," Ivan Saha, President and Chief Technical Officer, Vikram Solar said. "There is alluvial dust (present in plains of north India and delta regions of south India). This type turns into mud when water is poured. Then there is sandy dust (present in Rajasthan and Gujarat), which can be washed away easily with water."

Cleaning costs

Frequent cleaning, almost on a fortnightly basis, is required in most parts of Rajasthan and Gujarat owing to dry sandy dust, Mr Saha said.

"But apart from the dust, one other main issue is the hardness of the water," Mr. Khanna explained. "Hard water is not suitable for cleaning, and so we have to invest in reverse osmosis and other technology to make it suitable."

"Since many large-scale power plants are located in the interior regions of Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Chhattisgarh and parts of South India, getting soft water on sites becomes difficult at times," Mr. Saha elaborated.

"Therefore, reverse osmosis or distillation plants have almost become mandatory for solar plants in order to provide water which can be used for cleaning modules."

Apart from treating the water, the unavailability of a steady water supply also proves to be a problem for solar plant operators.

"We require about 3-4 litres of water to clean each module," Mr. Mehta said. "Water availability, especially in the remote areas where there are solar plants, is a problem. So we need water tankers." Overall, the system of operations and the issues specific to India have resulted in the operations of solar plants in India being more expensive than in most other countries. "Operations and maintenance (O&M) is highly automated in the West as compared to primarily manual O&M services in India, where it can be estimated to be between Rs.9-12 lakh per year per megawatt," Mr. Saha said.

Solar capacity in India has grown at a compounded annual growth rate of more than 60 per cent, from a little more than 1 GW of capacity in FY12 to more than 6.7 GW in FY16. The Ministry of New and Renewable Energy projected these figures to grow to 18 GW by the end of FY17, eventually reaching its target of 100 GW by 2022.

Rooftop solar

The government also plans to incorporate the still-dormant rooftop solar sector into its target for 2022, which means that individual households will also have to factor in the operational costs of having solar modules on their roofs. While the government has sanctioned Rs.5,000 crore to provide a 30 per cent capital subsidy for rooftop solar installations, this works out to a one-time fix. Consumers will still be expected to foot the water bill and cleaning bill. The government plans to add an average of 6.6 GW of rooftop solar capacity every year from 2016-17 to 2021-22.

"Another issue is that the skilled workforce required for cleaning and maintenance is not available in these areas and so we have to bring them in from other areas and train them," Mr. Khanna said. Companies in India are beginning to employ new technologies to counter the dust problem, Mr. Saha said. "Anti-soiling technology like dust-free glass with self-cleaning hydrophobic nano-coating stops dust from sticking to the glass of the module."

The result—higher operational costs—coupled with historically low tariffs for solar power could pose a future risk for the industry, according to Mr. Mehta.

Solar tariffs in India have fallen tremendously, 16.1 cents per unit in November 2010 to 6.7 cents per unit in January 2016, among the lowest rates in the world, according to EY.

Despite renewing interest in the sector,they have sparked concerns about risks in projects that assume strict cost parameters to turn a profit at such low tariffs. "Ten to fifteen years down the line, operational costs will increase and revenues will start to flatten," Mr. Mehta said. "So there is definitely a risk to profitability."