Quest for sunshine

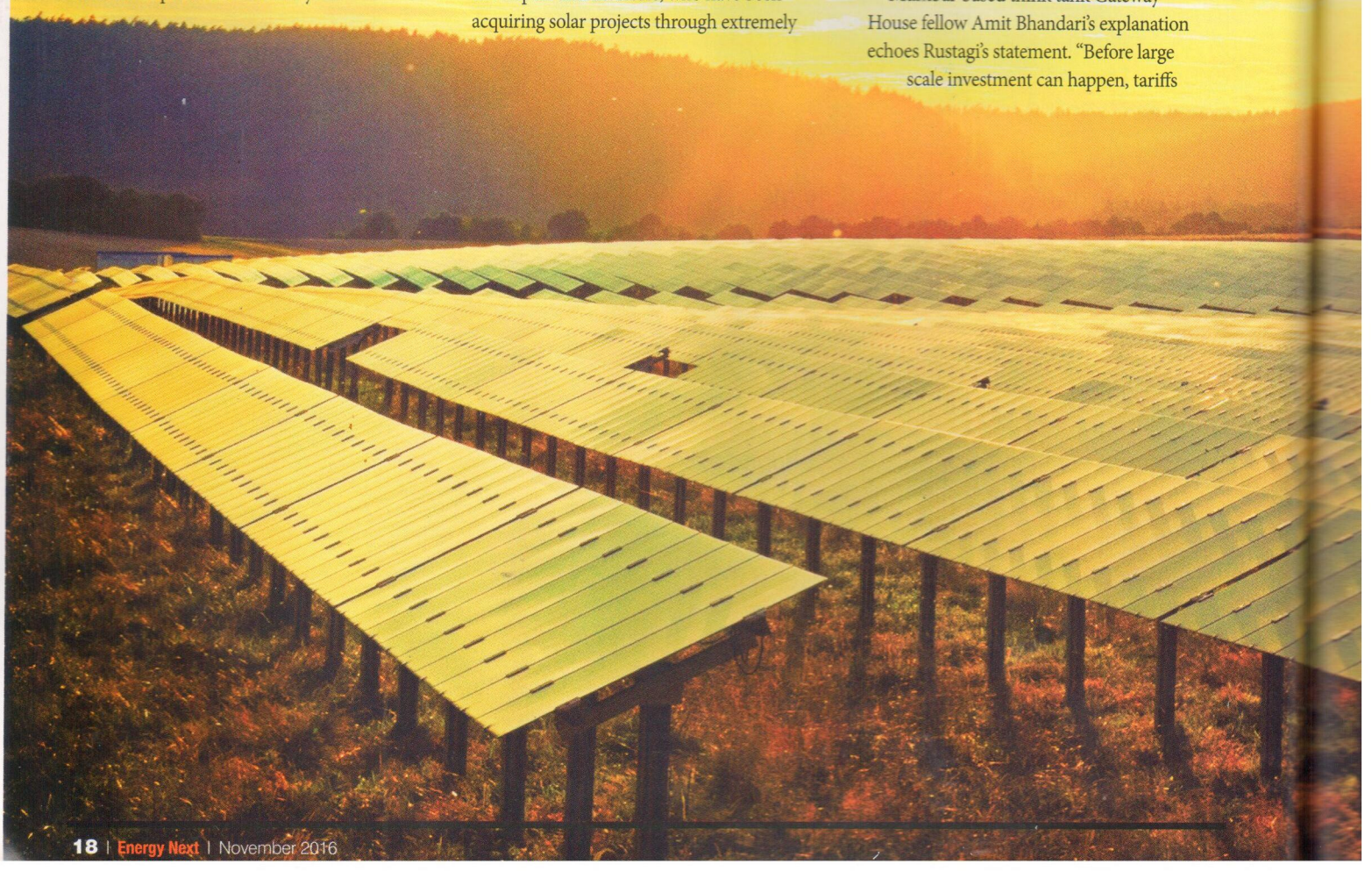
Competitive bidding in the Indian solar industry has facilitated lowering of tariffs further, and that has intensified battles for market domination amongst all solar power developers and investors, writes ***Orchie Bandyopadhyay.***

What was a tiny speck some years ago has grown to more than 9 GW now. The Indian solar market has taken off, and the country is all set to be powered by sunshine. You may ask what's behind all this? The answer lies in staggering falls in cost for solar power. The capital costs of solar power have fallen by 60% in the last four years and could drop by another 40%, according to Deutsche Bank analysis last year. Energy Minister Piyush Goyal went to the extent of saying solar power is a more cost-effective option than coal. "I think a new coal plant would give you costlier power than a solar plant," Goyal told media persons earlier this year.

But, what caused the fall in cost? A nationwide target of achieving 100 GW of solar power by 2022 and political backing by the Narendra Modi-led BJP Government coupled by India's moral commitment at the Paris climate conference to increase its energy mix to 40 per cent from non-fossil sources by 2030 have led to the cost to plunge by a huge margin. As also, cheaper imports from China and reduced pricing of polysilicon wafers have brought down the cost of manufacturing modules. At the same time, reverse bidding in the industry has facilitated lowering of tariffs further, and that has intensified battles for market domination amongst all solar power developers and investors, who have been acquiring solar projects through extremely aggressive bidding at auctions. The highly competitive race for solar will get more crowded with India ratifying the pact on climate change on 2 October. But it's time for a reality check. Are the low prices too fast and furious to sustain?

Vinay Rustagi, managing director of consultancy firm Bridge to India, says, "Falling tariffs are a double-edged sword for the industry. They make solar power more attractive for consumers and help drive faster adoption rates. At the same time, falling tariffs create a perverse incentive for older customers who have signed up to buy solar power at higher rates to default and look for cheaper options."

Mumbai-based think tank Gateway House fellow Amit Bhandari's explanation echoes Rustagi's statement. "Before large scale investment can happen, tariffs



need to stabilise. If as a buyer, I entered into a contract to buy solar electricity 3-4 years ago, I would be paying far more than if I entered into a similar contract today. So, there is an incentive for investors to wait and watch."

Falling tariffs can increase the uptake of solar, thus helping meet targets set by the government. However, there is a risk of players getting into the number game and betting too much on building their project portfolio. There is a possibility of quality being compromised to maintain profitability of projects. Solar energy also needs 100% of capex investment upfront. Therefore, quality can adversely impact the long term viability of a project. "The industry is already witnessing some of the lowest entry barriers in the industrial sector, which poses the risk of unregulated providers entering the market and deploying substandard material to protect margins," says Ashish Khanna, ED & CEO, Tata Power Solar.

For experts and developers, the reduction in solar tariffs due to reduction in module prices and project cost optimisation are definitely good for the industry and the consumers. "In fact, this is the reason why solar projects can compete head-on with other technologies on price of electricity," says Shantanu Jaiswal, Lead India Analyst, Bloomberg New Energy Finance.

For Anish Rajgopal, director at Chemtrols Solar, falling solar tariffs mean that solar tariffs are lower than grid tariff in many cases and that in turn leads to increased adoption of solar thus boosting the overall market. "In many states, solar tariffs are lower than grid for industrial and commercial consumers, thus encouraging these consumers to go in for solar as an alternative power source. We will eventually see widespread residential grid parity too which will then provide a significant fillip to residential installations."

Although the solar market is booming overall with plunging tariffs, its reliance on policymakers to protect the interests of all stakeholders cannot be ignored. "Nothing is bad, until the interests of all the stakeholders are protected. Investors want returns, financiers want security, developers want demand and consumers want lower tariffs. It is good for the industry. The Government just needs to facilitate the stakeholders in mitigating risks associated to it," says Rays Power CEO Ketan Mehta. Khanna shares similar thoughts. "If the solar industry has to grow sustainably, we need to create a win-win for all stakeholders. Our single minded focus on lowering costs will not help," adding that investment is crucial at this

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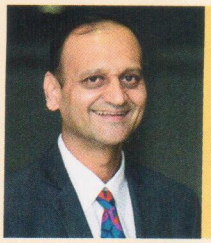

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stage, and the solar growth opportunity is also attracting substantial interest from foreign investors who benchmark plant quality and longevity against global standards.

Solar power tariffs have fallen below Rs 5/kWh since November last year, and are falling further as the industry doubles volumes every year and the cost of producing power continues to decline. There is a near consensus that lowering costs of modules and inverters will be a definitive driver for continued lower tariffs, as also innovation and research. "Solar PV tariffs could reduce in future due to the innovation and research that is going on in the way solar modules are manufactured to reduce wastage and thus make them cheaper. Efforts are underway to improve efficiencies of existing modules by moving to newer technologies and materials. Some non-module related cost reductions have also been observed in solar projects and there too we can expect further improvements," observes Jaiswal.

There is also an increasing amount of operational learning, technological advancements and financial innovation that will help this trend. "Solar modules will become cheaper because of incremental improvements in production and material efficiencies. Finally, there are many new promising technologies in early stages of development that could leapfrog the current generation equipment by doubling efficiency and plant output," adds Rustagi.

Technological improvements in module efficiency, 1500 V inverters, etc. also lead to lower costs for the Balance of System (BoS). "Increased module efficiency also means lesser land use and the BoS cost comes down too. Tracking technology enhances output disproportionate to the increase in cost, so that is going to provide significant efficiencies too," points out Rajgopal. While Bhandari states that lower cost of electricity storage should lead to a reduction in solar tariffs.

Solar PV tariffs have been reducing since 2011 on the basis of economies of scale and, to some extent, oversupply, according to Khanna. "In the first half of 2016, due to oversupply in the market especially of imported modules, solar module prices have already fallen sharply." The key aspect to understand is that this reduction has not been on the basis of any significant technological shift though there has been improvements in the manufacturing process as well as raw material and components upgradation. Khanna adds further that limited and smaller reductions in tariff will continue to happen due to better manufacturing processes, reduction in raw material and component costs, better inventory management and building local economies of scale. "We cannot however expect this shift to be permanent or extremely significant in terms of numbers," he states.

For Mehta, it is cost of capital, risk appetite of the investors, supply chain and process innovation that will lead the race to the bottom in solar tariffs.

But, there are several factors that constrain action on the ground such as land acquisition, poor evacuation facilities and reluctance of DISCOMs to buy clean power. "There are many instances where projects are not built on time or not built at all. Land acquisition has traditionally been a big problem and it is likely to get worse over time as renewable sector grows further. But there are other problems contributing to delayed implementation – transmission connectivity is also a major concern," says Rustagi.

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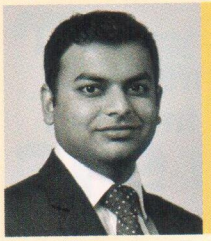

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Then there are instances of companies unable to find financial closure for their projects due to low solar tariffs. As a result, banks and other financial institutions have refused to fund many of the successful bidders. The lenders are reluctant to fund such players, fearing the loans might turn bad.

Mehta warns that financiers are cautious: they will protect their interests. "Developers have to first commission the project, get the cash flow positive, start servicing the lenders, only after this new funds can be sourced. Without a proper viability of the project, why would any financial institution fund them?"

"If the developers are unable to achieve financial closure, it is their inability in proving the project viability. It cannot be termed as the industry trend. Industry is fine and finance will keep flowing," he continues.

Rajgopal says that there are a few companies who have bet on low module prices and hence possibly made aggressive tariff bids on the basis of that estimate. "When prices did not come down to the extent they expected, these projects became financially unviable in terms of internal rate of returns (IRRs) and debt service cover ratios (DSCRs), thus leading to financial institutions refusing to fund them. However, it is to be noted too, that many developers who bid what were considered aggressive tariffs early on this year are now reaping the benefits of reduced module and BoS costs."

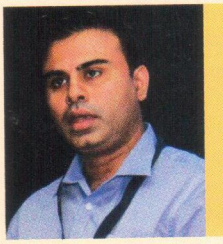
Access to capital, both debt and equity, is a major challenge in the sector particularly for the smaller and medium sized developers. "The bigger developers, backed by prominent international utilities, Indian corporates or PE funds are much better placed in this regard. We have seen many projects being awarded after long auction process but not being finally built because of lack of capital or inability to procure land/transmission evacuation," adds Rustagi.

Jaiswal agrees that there are some companies that are more aggressive than others and it is not something specific to India alone as it has happened with auctions in some other countries as well.

"Currently there are only a few projects facing difficulties in achieving financial closure and so it should be treated as an exception rather than a norm. Such projects can make foreign investors anxious and delay their due diligence process. If the auctioned projects do not proceed as planned then there is a loss of credibility of the industry and the auction process as well. On the positive side, the difficult times make companies try new ways and means to further bring down the costs or improve profitability," states Jaiswal.

However, Bhandari believes that given the large number of projects that are being pushed it is quite likely that not all will materialise - that has been true for other sectors such as roads and power as well. "If a bid is unviable, it is better that the project doesn't take off, rather than create bigger problems down the road."

Though lower tariffs are a positive for consumers, still there are apprehensions that investors won't get the returns they want. "Apprehensions are there due to the pressure on profitability that companies can experience when bidding too aggressively," opines Jaiswal, adding that there are IPPs that have submitted lowest bids just to enter the solar market with the aim



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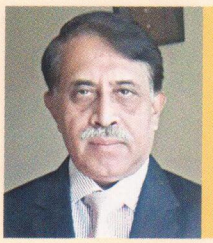

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of making favourable returns in the projects that they plan to commission at a later point in time.

The apprehension that investors have when they see lower tariffs is essentially about whether the project is financially viable. However, lower tariffs are a consequence of lower actual project costs. "A well structured tariff backed by proper costs is a sound investment for any investor," says Rajgopal.

Also, there are a few instances where the developers did not consider volume risk and payment risk which generally affect the profitability of the project. "Good planning, execution and proper risk assessment will help in addressing this issue," advises Mehta.

Detailing further, Khanna says, "When a 25 year business proposition is not built on a strong foundation, the risk of diminishing returns increases. Low tariffs could mean solar players cutting back on their normal return expectations and might ignore quality parameters, which will eventually result in lowering of returns. Let us not forget that by nature, solar is an infinite power source. Infrastructure at grid level and health of DISCOMs are also critical to realise the return expectations from current projects."

Speaking about DISCOMs, last November, the Centre announced the launch of the Ujwal DISCOM Assuarnce Yojana (UDAY) scheme to address the cash flow strain on distribution companies through transfer of debt load to states. However, according to India Ratings and Research (Ind-Ra), state power utilities' "insensitivity" to project debt service commitments and delay in making payments are plaguing renewable energy projects.

This, therefore, makes it clear that credit

profile and timely payment capability of state utilities matter greatly. "State utilities are the buyers for most of the electricity in India - if they are not in sound financial health, the rest of the sector, including renewable energy, will be in trouble as well. Having said that, renewable energy companies are somewhat better placed than thermal power because they have lower operating costs - so if the payment is delayed, it doesn't mean they have to cut back or stop operations," says Bhandari.

An assurance from Uttar Pradesh Electricity Regulatory Commission chairman may cheer up developers. "Although credit worthiness of DISCOMs is a very crucial issue, but so far as UP is concerned, after seeing the response of RE developers, it may be inferred that this is not seen as any hindrance by them," says Desh Deepak Verma, chairman of UP Electricity Regulatory Commission.

And, the risks for achieving the 100 GW of solar power by 2022? Since nature of renewable energy, solar and wind in particular, is intermittent and fluctuating, the addition of huge quantum of RE to the tune of 175 GW would certainly be a challenge for maintaining the grid stability and security, points out Verma. "Obviously, when the whole RE capacity becomes operational, during that time other generators running on conventional fuel shall be required to back down, which would need to be tackled, both technically and financially."

According to Bhandari, the single biggest issue is that solar power equipment is mostly being imported - so India is not getting the full benefit of this huge build-out of infrastructure. "At this point in time, solar panel technology is changing/improving fast - which means technology becomes obsolete fast. This is not good if you are licensing tech from someone else. Licensing will have to wait till technology has stabilised, which will take some time."

The insolvency of the state power distribution companies - many of which have large accumulated losses and which can't afford anything but the cheapest electricity - is also a big risk. "Unless the buyers are financially sound, solar electricity (or any other electricity) will not take off," concludes Bhandari.

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