



## Is India hurting from self-inflicted solar burn?

The sector is bright and shining, but experts are afraid that players are getting way ahead of themselves as issues on lack of access roads, clean green lands, and proper land area demarcation hamper development of solar parks.

When you ask project developers tasked with building India's solar parks what their most pressing challenge is, most will point outside their window to the vast tracts of undeveloped land with inadequate roads and other essential infrastructure. Execution blunders continue to hamper the country's attempts to build solar parks and other promising solar PV projects.

"Project developers are citing issues including lack of access roads, clean green lands, and clear demarcation of land areas in these solar parks," says Priyadarshini Sanja, managing director at Mercom Capital Group.

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There has been a push to build dozens of solar parks in India but this has been saddled by delays relating to poor infrastructure support, says industry insiders. These delays threaten to increase project costs and decrease profitability for solar parks.

### Are solar parks problematic?

Solar parks — one of the pillars envisioned to usher India to a more secure energy future — accounts for 20GW of the 100GW of solar capacity that India is targeting by 2022.

Currently, there are 34 solar parks planned across 21 Indian states, all of which have received in-principle approvals. In these solar parks, projects aggregating 20GW will be set up, and the Ministry of New and Renewable Energy (MNRE) is even considering increasing the capacity to be developed at solar parks to 40GW.

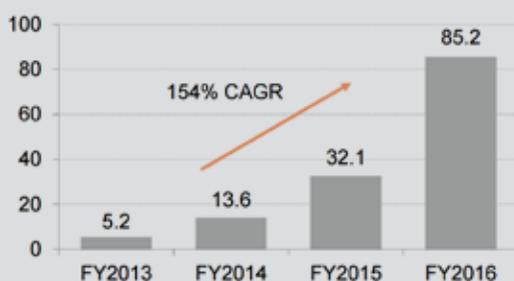
Under the guidance of the MNRE, in some states, the Solar Energy Corporation of India (SECI) has formed joint ventures with state renewable energy agencies to construct these solar parks. State nodal agencies are also the implementing agencies in locations such as Arunachal Pradesh, Assam, Gujarat, and West Bengal, amongst others. Meanwhile, the National Thermal Power Corporation

(NTPC) is overseeing the construction of solar parks in Andaman and Nicobar Islands. However, delays relating to infrastructure and site preparation have hampered project development for some solar parks — and these are not isolated occurrences. "The issues around solar parks are typical to the Indian solar sector," says Raj Prabhu, CEO of Mercom Capital Group. "Most policies are well-intentioned with top-down goal setting, but the problem usually is on the execution side."

One major criticism levelled against the government is its rush to auction projects in these parks even before completing land acquisition formalities. This has brought headaches to project developers who end up winning bids but then find that infrastructure is not ready for them to start construction. In the Pavagada, Charanka, and Kadapa solar parks, bid-submission deadlines for tenders have been reportedly extended repeatedly.

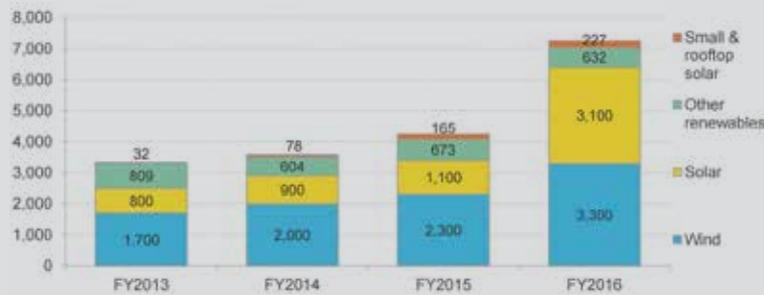
"The government is in a hurry to invite tenders even before they have completed land acquisition which ends in a delay of four to five months before the auctions happen. Developers, meanwhile, are paying for park infrastructure that is non-existent," says Sanja. "Much of the infrastructure is being built parallel to project construction and will be complete

Installed capacity under captive model only (MW, n=21), by year



Source: Bloomberg New Energy Finance

## Annual capacity additions in India's renewable energy sector (MW)



Source: Bloomberg New Energy Finance

when projects are close to completion, which doesn't help the developers. After paying steep park fees, developers are having difficulties to build parts of the infrastructure." Developers argue that delays and additional incurred expenses seriously affect project costs and profitability, especially if they end up having to clean the land, build roads, and wait for power to be evacuated after commissioning. Whilst the bidding process is transparent and the promised infrastructure is ideal for international investors, these nuisances can be quite a burden for solar park project developers.

But government officials argued that development of solar parks is in its early stages and whilst the process is not perfect, state nodal agencies are working hard to resolve issues when they arise. "Solar parks are huge projects and these problems are minor when you look at the capacity that will be achieved. It has just been two years since we ventured into solar parks," commented an SECI official.

### No solar parks in just a few days

The MNRE has reportedly requested that the Principal Secretaries and the Chief Secretaries of State Governments take up necessary action for speedy implementation of solar power projects so that solar targets are achieved on time. MNRE is also conducting regular review meetings with state governments and solar park developers to keep projects on track.

"Solar parks cannot be completed within days. A lot of planning is required — problems will come up but we are here to handle them," commented an MNRE official. The development issues surrounding solar parks have increasingly attracted attention as India faces the triple energy challenge — meet the growing energy demand, cut down on pollution, and connect more than 300m people to the power grid.

Ramping up renewable energy production has emerged as one of the

solutions to this triple energy challenge, which is why the government has set the target of building 175GW of renewable energy by 2022 — primarily solar and wind, says **Shantanu Jaiswal**, lead analyst for India at Bloomberg New Energy Finance. At the end of FY2016, India had 42.6GW of installed renewable energy capacity, excluding large hydro, which represents 14% of total generation capacity. "2016 is on track to become the best year for renewable installations," says Jaiswal. "The sector is not only drawing Indian firms but also foreign utilities. Power generation companies particularly from Europe and Asia are increasing their presence through greenfield investments or acquisitions."

"PV is rapidly emerging as the king of Indian renewables," Jaiswal adds, pointing out that the sector saw an impressive 59% CAGR in the last four fiscal years to reach 6.8GW installed capacity at the end of FY2016. Solar still represents only 2% of grid-tied generation capacity, but it is growing twice as fast as wind and coal on the back of federal and state-level auctions.

### King of Indian renewables

Solar power is also being installed in almost all states across the country, unlike wind power which is focussed in the southwest of the country. The more distributed nature of solar has become a key advantage over other renewables, helping alleviate transmission bottlenecks and bringing generation closer to the point of consumption.

Led by solar, India's share of renewable energy in the total capacity mix has been ramping up to 14.1% in FY2016 from 12.5% in FY2013. "We believe that this percentage will keep on increasing, as India adds renewables, coal, and some hydro capacity," says Jaiswal, given that renewables are already having a higher growth rate in the country, with a cumulative CAGR of 15%, surpassing the 12.5% for coal power plants.



Priyadarshini Sanja



Raj Prabhu



Shantanu Jaiswal

Another encouraging trend is the rise in investments in utility-scale projects after the government announced the target of having 175GW of solar, wind, and biomass installed by 2022. Jaiswal reckons asset finance has grown by nearly 60% to \$10.5b in FY2016 from \$6.6b in FY2014, with solar obtaining the most investment in the last financial year. "Despite this strong position, the renewables sector needs to accelerate its pace even more to meet the government targets," argues Jaiswal.

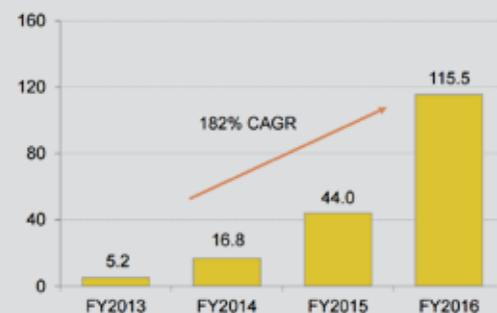
If execution and financing issues are addressed, India stands to become a global force in solar energy, argue analysts. The country has one of the world's highest solar intensities and boasts of low-cost manufacturing, and solar energy is one of its most substantial and rewarding opportunities, says McKinsey & Company.

### More fund is still needed

The analyst estimates around \$100b asset finance is needed during 2016 to 2022, including \$30b in equity capital, if India is to reach its goal of 135GW of utility-scale renewable energy by 2022. The country will also need to figure out how to reduce financing costs considering it currently has the highest cost of capital in the Asia-Pacific region.

To raise the next \$100b of asset finance, capital markets must play a bigger role. This will mean the growing prominence of green bonds, both domestic and offshore ones, and already the market is seeing their use to raise debt or refinance projects. On the equity side, infrastructure investment trusts should start to gain traction. "The idea is that investor interest is protected and developers can quickly recycle equity in large commissioned projects by selling it to long-term institutional and retail investors seeking lower, but more stable returns," says Jaiswal. "These structures have started to attract interest and could be crucial for the estimated \$30b equity that the utility-scale projects need."

## Capacity installed since FY2013 (MW, n=26), by year



Source: Bloomberg New Energy Finance