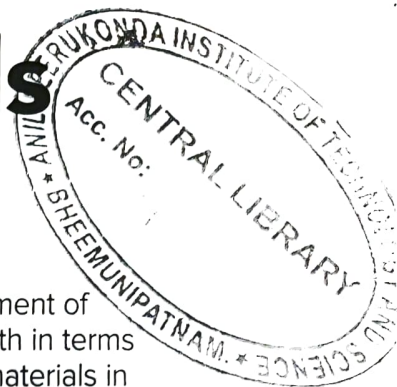




## Solar Optimism Needs To Be Back In India



Sustainable growth of the solar energy industry depends on successful management of photovoltaic (PV) waste. PV waste recycling is still at a nascent stage globally, both in terms of technical standards and physical infrastructure. Use of potentially-hazardous materials in manufacturing and lack of commercially-viable module recycling technologies demand a strong regulatory approach to this problem



**Sudeshna Das**  
is director at  
ComConnect  
Consulting

India has the potential to become the world leader in the solar sector by satisfying future energy demands while reducing carbon footprints. Growing need for energy in India is perfectly aligned with its green energy transition initiatives. However, the country needs to become self-reliant by developing the value chain ecosystem. This, in turn, will also help the Indian solar sector to become competitive in the long run. The industry can ensure long-term sustainable growth on successful adoption of emerging business models, innovative technologies like floating solar as well as with the proper vision to handle future challenges like PV waste management.

### Market at a glance

The first quarter of 2019 saw sluggish growth due to general elections as well as challenges like Goods & Service Tax (GST) implementation, safeguard duty and compliance with

Bureau of Indian Standards (BIS) standards, sudden change in solar park development policy, under subscription and cancellation of tenders, no implementation of much heralded schemes like Sustainable Rooftop Installation for Solar Transfiguration of India (SRISTI) and Kisan Urja Suraksha Evam Utthaan Mahabhiyan (KUSUM), and so on.

According to a Bridge To India (BTI) report, total installed utility-scale solar installation (Fig. 1) in the country reached 26,154MW as on March 2019. Capacity addition fell to 4810MW, down a steep 47 per cent (Fig. 2) over the previous year.

However, total pipeline of utility-scale solar projects is quite high. Thus, installation capacity is expected to boom in the next 24 months.

Last year was notable for the exponential growth in the open access (OA) market, where total OA installed capacity reached approximately 1359MW by March 2018 (Fig. 3) itself. Karnataka led the market in terms of installed capacity (1592MW), followed by Madhya Pradesh (332MW), Telangana (322MW), Andhra Pradesh (208MW) and Tamil Nadu (164MW).

OA solar is fundamentally a very attractive market opportunity. Main drivers are rising cost advantage over grid power and policy thrust on mitigation in carbon emissions. Solar power also enjoys several operational advantages over thermal and wind power such as shorter gestation period, lower technical complexity and larger potential area of deployment.

### Solar park schemes simplified

Modifications in Development of Solar Parks and Ultra Mega Solar Power Project scheme

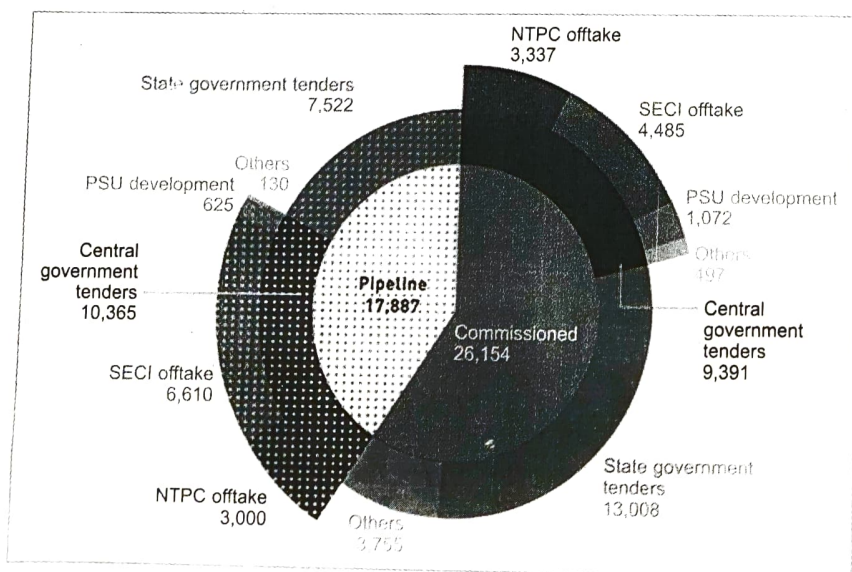


Fig. 1: Total utility-scale solar installations in India in 2018-19 (Source: Bridge To India)

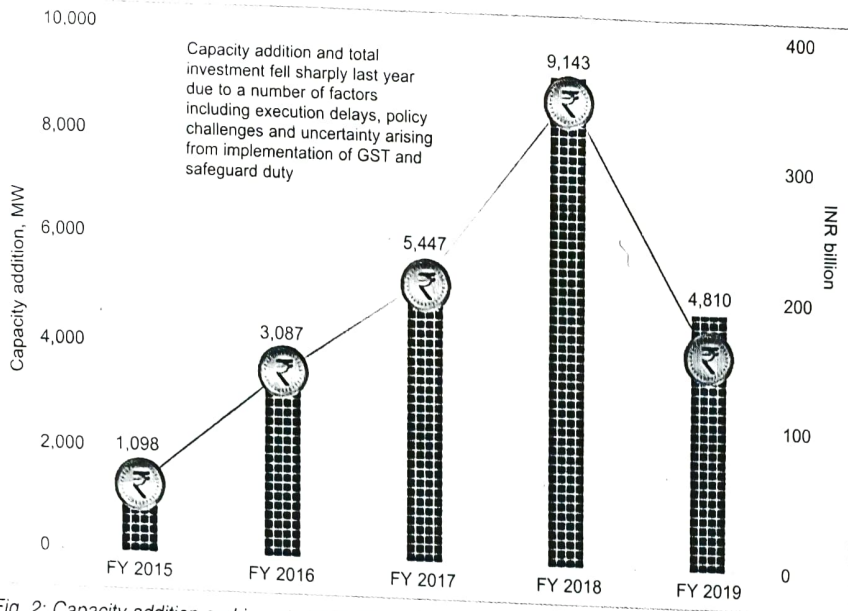


Fig. 2: Capacity addition and investment in the Indian solar sector

were announced by Ministry of New and Renewable Energy (MNRE) in March 2019. According to the ministry, in a notification, to address the two most critical elements, namely, land and power evacuation infrastructure for solar parks, a new mode is being introduced for the development of renewable energy parks (solar/wind/hybrid/other renewable energy parks) through Solar Energy Corporation of India (SECI).

According to the amended guidelines, named Mode-7, SECI will make both government and private land available for successful bidders for setting up projects with the assistance of the state government. In addition to land cost, solar project developers would also pay a facilitation charge to the state government. Facilitation charge would be calculated as two paise per unit of power being generated in these parks. Further, no fund from Central Financial Assistance (CFA) would be utilised for procurement of land.

SECI would act as Solar Power Park Developer (SPPD) and arrange the external power evacuation infrastructure of the parks developed by External Transmission Development Agency such as transmission utilities. However, internal infrastructures of the renewable energy parks, including battery storage, will be done by renewable energy project developers at their own cost. And this would be factored in the tariff to be bid by project developers.

Under the new guidelines, SECI would also set up Payment Security Mechanism to make setting up of renewable energy projects in such parks more attractive. The idea is to ensure continuous payment to developers and mitigate risk due to default in payments by discoms.

According to the new MNRE memorandum, under Mode-5A, any central public sector unit (CPSU) or special-purpose vehicle (SPV) formed by the CPSU or government organisation that has land, or has arranged land from various state governments or the central government, can approach the ministry directly to set up a solar park.

Earlier, it was mandatory for the CPSU to be the owner of the land. Moreover, earlier it was a must for the CPSU to own the land before approaching solar park developers for open bidding. But now it is not

mandatory for it to own land before approaching solar park developers. In fact, private entrepreneurs can also develop solar parks. However, private players will not get any central financial assistance (CFA).

As of March 31, 2019, MNRE has approved 38 solar parks in India with a total capacity of 23,104MW (Fig. 4) across sixteen states. The existing solar park scheme provides for CFA of two million rupees per MW or thirty per cent of the project cost, whichever is less, for setting up of both the internal and external evacuation infrastructure. Thus, this amendment would increase solar park project cost for developers.

### Pending policies

Announcement of concrete plans for new solar schemes like SRISTI and KUSUM has been pending for a long time. However, considering the pressure for farmer-betterment-related plans and reforms, KUSUM scheme may see some progress. According to a Press Information Bureau (PIB) release, KUSUM scheme is intended for harnessing solar power for rural India. Under this scheme, farmers can install solar water pumps in remote areas for irrigation needs and also earn extra income by selling surplus solar power to discoms. The scheme will provide assistance for:

- Installation of grid-connected solar power plants, each of capacities up to 2MW, in rural areas
- Installation of standalone off-grid solar water pumps to fulfil irrigation needs of farmers who are not connected to the grid
- Solarisation of existing grid-connected agriculture pumps to make

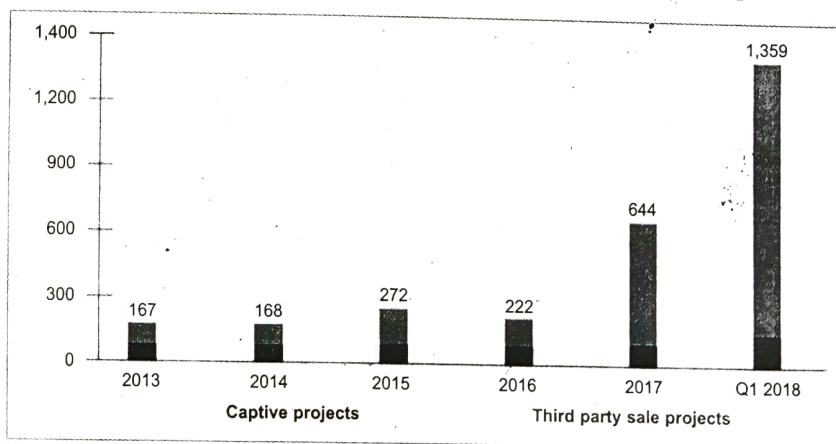


Fig. 3: Open access (OA) solar capacity (in MW) addition in India

farmers independent of the grid supply, and also enable them to sell surplus solar power generated to discoms and get extra income

- Solarisation of tubewells and lift irrigation projects of the government sector

### Floating solar, an emerging trend

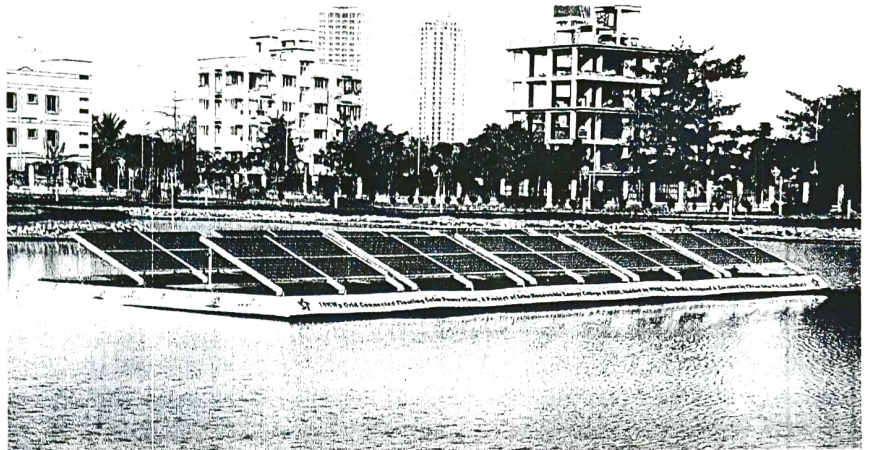
Floating solar, an emerging and innovative application of solar PV technology, was conceived to overcome land scarcity issues. It can be deployed on various types of water bodies including industrial water ponds, irrigation or drinking water reservoirs, quarry lakes, aquaculture ponds, canals and dams. Most of the deployment is on fresh water until the challenges associated with marine environment (high turbulence and salt mist corrosion) are overcome. Key drivers making floating solar attractive are:

- It solves land scarcity issues and negates the need for expensive and time-consuming land acquisition process.

- It can use existing grid infrastructure. For example, a floating solar project located near a consumption centre or on a reservoir of a hydroelectric dam can work with the existing transmission infrastructure.

- It provides efficient electricity generation, as cooling effect from water surface on the panels results in three to five per cent more power output as compared to ground-mounted solar modules.

China is the leading international market, followed by Japan and South



Floating solar power in India (Credit: www.vikramsolar.com)

### Impact of Union Budget 2019-20 on the solar sector

- Total budgetary allocation for the renewable sector in 2019-20 is ₹ 52.5 billion. This is only two per cent higher than the 2018-19 allocation.
- Almost sixty per cent (₹ 30 billion) of the total budget has been designated for the solar sector.
- ₹ 24.8 billion will be for 7500MW grid-connected solar projects, and the rest will be for off-grid projects.
- The government is focusing on boost solar cell manufacturing.

Korea. This concept is still in the nascent stages of development in India. According to a PHOTON report, after the recent commissioning of a 2MW project at Visakhapatnam, cumulative capacity of floating solar reached 2.7MW in the country. MNRE intends to add 10GW of floating solar as part of its 227GW renewable energy target for 2022.

### Moving forward

Sustainable growth of the solar energy industry depends on successful management of PV waste. PV waste

recycling is still at a nascent stage globally, both in terms of technical standards and physical infrastructure. Use of potentially-hazardous materials in manufacturing, and lack of commercially-viable module recycling technologies, demand a strong regulatory approach to this problem.

The European Union (EU) has taken the lead with a comprehensive plan for allocating liability, setting recovery and recycling targets, treatment requirements and consumer awareness.

India is still not well-equipped to handle PV waste as there are no policy guidelines available for the same. Even e-waste management rules in the country do not mention anything about solar PV waste. Thus, lack of a policy framework coupled with unavailability of basic PV recycling technologies in the country have worsened the situation.

As per Central Pollution Control Board's (CPCB's) estimate, less than four per cent of estimated e-waste is recycled in the organised sector. Thus, it is imperative for India to create a robust regulatory framework that clearly mentions the responsibility and specify standards for PV waste management. **EFY**

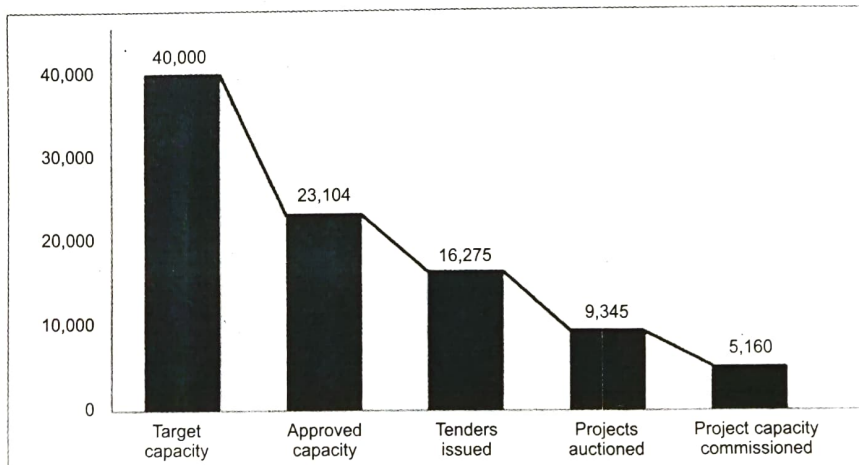


Fig. 4: Capacity-wise (MW) solar park development status in India till the end of 2018-19 (Source: Bridge To India)