

India's Electricity Sector Transition Still on Track Despite a Weak FY2018/19

Slowdown in Capacity Additions

FY2018/19 turned out to be a sluggish year for both the thermal as well as renewable sectors in India in terms of generation capacity additions. In total, only 12GW of capacity was added; compared to an average 22GW capacity added between FY2012/13 to FY2016/17 and 17GW in FY2017/18.

India added 5.8GW of new coal-fired capacity but closed 2.4GW of end-of-life thermal power plants during the year, giving net new thermal capacity adds of just 3.4GW. This is the lowest thermal power plant net increase in a decade for India.

New on-grid capacity additions in renewable energy stood at 8.6GW (6.5GW of solar, 1.6GW of wind and 0.5GW from other sources) for the financial year ending in March 2019. In addition, some 1.6GW of behind-the-meter rooftop solar capacity was also added during the calendar year 2018, up 68% year-on-year, a highlight for the Indian electricity sector.

The continued decline in thermal capacity addition is foreseeable given the ongoing financial distress in the thermal power sector and the loss of competitiveness versus domestic renewable energy. Against this, the slowdown in renewable capacity additions at half the government's targeted run-rate comes 'against the run of play.'

Figure 1: India On-grid Capacity Additions FY2017/18 vs. FY2018/19

Source	March 2018	March 2019	Change GW
Renewables	69.0	77.6	8.6
Large Hydro	45.3	45.4	0.1
Nuclear	6.8	6.8	0.0
Thermal	222.9	226.3	3.4
Total On-grid Capacity	344.0	356.1	12.1

Source: CEA, MNRE, IEEFA calculations.

Note: Renewables excludes 2.4GW of behind the meter rooftop solar.

Some of the key reasons for below-expected renewable capacity installations in FY2018/19 include:

- Lingering uncertainty over the imposition of 25% trade duties on imported solar modules, with a lack of clarity for the best part of a year forcing developers to hold off their module imports, in turn delaying project commissioning, given the import duty reduces after 12 months.

- Lack of clarity on the taxation classification for solar modules, inverters and construction contracts amidst the newly rolled-out GST regime.
- The rapid transition from generous feed-in-tariffs (FiT) to exceptionally competitive reverse bidding auctions to award wind power capacity in FY2017/18 saw wind tariffs halve and industry profit margins evaporate, forcing a supply chain revamp and resulting in very slow capacity commissioning in FY2018/19.
- A slower than needed growth in power evacuation and grid transmission infrastructure in potential renewable energy zones that kept developers away from bidding for projects.

About 5.5GW of awarded renewable energy capacity was cancelled during the last 15 months by state and central agencies in expectation of even lower than auctioned tariffs. Given most tenders cancelled were sub-Rs3/kWh, this was counter-productive in delaying investment at rates some 10-20% below prevailing wholesale Indian electricity tariffs.

Although this did not explicitly impact capacity commissioning during the year, it was reflective of a turbulent time for the Indian renewable energy industry in which investors, developers and the government seemed to grapple with an appropriate balance in risk-return sharing in what is proving to be an enormously positive long-term energy transition.

Long-term Outlook Still Favourable for Renewable Energy

At the beginning of FY2017/18, India saw a dramatic decline in wholesale electricity tariffs from solar and wind generation sources with capacity consistently awarded at sub-Rs3/kWh through reverse bidding auctions. With zero indexation on these tariffs, renewables have broken through grid parity and have continued to capture increasing market share as the new low-cost source of capacity since 2017.

IEEFA views FY2018/19 as a 'blip' for the Indian renewable energy industry, as its long-term technology and price-based fundamentals will continue to strengthen the industry's upward trajectory.

The associated energy security gains for India are compelling, particularly now that the 100% electrification goal has been achieved. This opens up enormous potential for the convergence and progressive decarbonisation of both the transport and stationary power sectors.

India's growing annual oil import bill is another important reason for supporting Prime Minister Narendra Modi's solar ambitions.

Short-term missteps are getting in the way at a time when India is considering an even more ambitious acceleration of renewable energy deployments to **500GW by 2028**, requiring a US\$500bn investment in generation and another US\$250bn in grid expansion and modernisation.

Flurry of Auctions and Tenders in the Last Two Quarters of FY2018/19

Despite the chaos evident in completions, India exited the year with 22.5GW of renewable capacity auctions awarded but yet to be built, and another 37GW of capacity under various stages of tendering and bidding.

Of the 22.5GW of renewable capacity auctioned in the last year, 21.6GW of this was awarded at below Rs3/kWh, with zero indexation for 25 years – locking in real electricity sector deflation for decades to come.

In the last quarter of the year alone, 32GW of new tenders were announced. Tenders entail rounds of Request for Proposals (RfP), technical bidding and shortlisting of final participants for the auction.

According to the Ministry of Renewable Energy's March 2019 [statement](#), 75GW of renewable capacity has been installed across India, 28GW auctioned and 37GW of capacity is under various stages of tendering and bidding. If all these plans come to fruition, this amounts to a total of 141GW of renewable capacity, relative to the government's target of 175GW by 2022.

Provided the 37GW of tendered capacity is awarded in the next six to nine months, it will mandate developers to commission this capacity before March FY2022 (the deadline for commissioning solar and wind power projects is generally 24 months).

Figure 2: India's Existing and Projected Renewable Energy Capacity Additions

(GW) Source	Installed Capacity as of	Capacity Additions	Estimated Capacity Additions			
	FY2018/19	FY2018/19	FY2019/20	FY2020/21	FY2021/22	Total
Utility Scale Solar	26.7	6.5	7.5	11.6	14.0	59.8
Rooftop Solar	3.9	1.6	2.0	3.0	4.0	12.9
Wind	35.3	1.7	5.0	6.4	6.4	53.1
Biomass+RoR	13.8	0.5	0.5	0.5	0.5	15.3
Floating Solar				0.1	1.4	1.5
Hybrid Wind & Solar	0.1			0.4	0.7	1.2
Total	79.8	10.3	15.0	22.0	27.0	143.8

Source: Mercom India, IEEFA estimates.

Note: Installed renewable energy capacity of 79.8GW as of FY2018/19 includes 2.4GW of behind-the-meter rooftop solar capacity, plus 1.5GW of on-grid rooftop solar. RoR = small scale, run-of-river hydro.

Bridge to India estimates 1.6GW of rooftop solar capacity was added during calendar year 2018, a growth of 68% in new installation compared to 2017. India's rooftop capacity has been growing at a cumulative average growth rate (CAGR) of 90% over the past six years.

Sustaining a near-doubling of annual capacity installs will be difficult, however, as ongoing market expansion could mean another 9GW of rooftop solar installs by FY2021/22, taking cumulative installs to 12.9GW. (By comparison, [Australia is on track to hit 10GW of cumulative rooftop solar in 2020](#)). Our upcoming blog will cover the outlook for the rooftop solar segment in detail.

Given the existing wind and solar tenders' trajectory and other renewable sources of biomass and run-of-river (RoR), IEEFA forecasts India is set to reach 144GW renewable energy capacity by FY2021/22, not too far from the aspirational 175GW target set back in 2015. This would also put India on a run-rate to exceed its 275GW target for 2027.

Another Flat Year for Solar

On 30 July 2018, India imposed a [safeguard duty](#) on imported solar cells from China and Malaysia for two years. There is a 25% import duty payable for the first year, 20% for the ensuing six months and 15% for the remainder. The applicable import duty period ends on 29 July 2020.

IEEFA continues to view this as an entirely counterproductive and ineffective strategy to prop up the unviable and subscale domestic module manufacturing sector in the face of ultra-competitively priced Chinese imports backed by enormous economies of scale and rapid, ongoing technology innovation.

We expect solar developers to hold off their module imports to pay the least rate of safeguard duty at 15%. Which could mean a sluggish commissioning rate for solar during the first three quarters of FY2019/20 as the 20% import duty period ends on 30 January 2020, with accelerated commissioning likely to take place after that date.

Given the amount of import duties, developers are likely to risk delaying their module purchases despite currency exchange volatility that could further push prices up.

IEEFA expects another near flat year for utility-scale solar with 7-8GW commissioned by March 2020.

Wind to Bounce Back in FY2019/20

The wind power sector is most likely to see commissioning of potentially 5GW of new capacity which is under construction now with its commissioning deadline in FY2019/20.

India wind power giant Suzlon Energy's group CEO, JP Chalasani, [expects 2019/20 to be a positive year for wind power in India](#). Apart from its government-backed project order book Suzlon expects growth to come from corporate power purchase agreements – a rising trend in electricity markets all over the world.

Commissioning to Accelerate FY2020/21 Onwards

FY2020/21 and FY2021/22 will see accelerated deployment of the renewable capacity that has already been awarded, while capacity currently under the tendering process will be awarded over the next six months.

Despite the general 21 to 24 months commissioning deadline, the awarded capacity could be expected to be commissioned well before its scheduled due date. [Renew Power commissioned 300MW](#) of capacity at Karnataka's Pavagada Solar Park within 13 months. The capacity was awarded in March 2018 and the company notified commissioning of the capacity in April 2019.

Large developers such as Renew power, Azure, Tata power, Adani, Mytrah, and SoftBank could be expected to be more efficient in delivering projects before their scheduled deadlines, if the government can remove disincentives that cause delay.

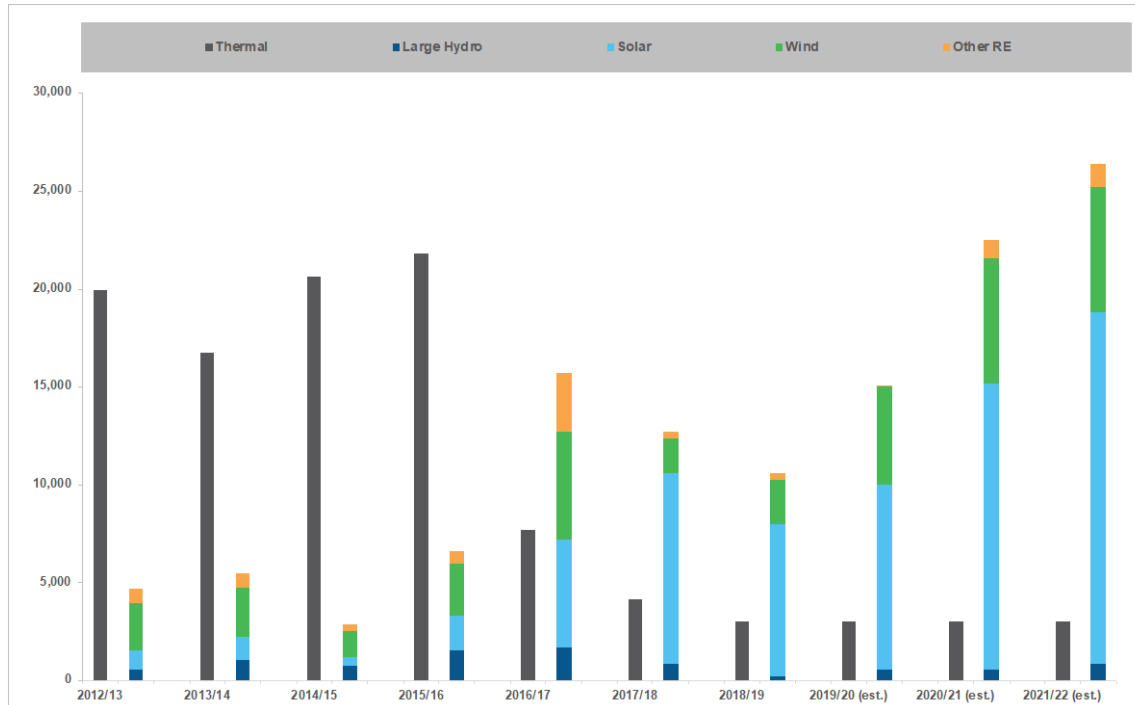
There are several challenges that could hinder the accelerated deployment of renewable energy capacity. The government of India must anticipate these challenges in advance and mitigate these risks as soon as possible:

- The accelerated capacity must be accompanied by accelerated expansion and modernisation of the grid network and power evacuation infrastructure.
- A policy framework for 'time-of-day' pricing must be implemented as soon as possible to support and incentivise grid flexibility solutions such as battery storage, pumped hydro storage, peaking gas generation, fast-ramping coal-fired power, concentrating solar thermal and demand response management.
- The central and state governments must proactively liaise to ensure timely land allocation for projects.
- Any retrospective policy changes should be avoided. These can cost months of delays and, in turn, dampen investor confidence.
- State discoms must avoid cancelling awarded capacities; upper caps for tariffs in auctions should be decided fairly and take into account industry feedback.

The Transition Has Begun to Accelerate

The Ministry of New and Renewable Energy plans to maintain auctioning of 40 GW of wind (10GW) and solar (30GW) in FY2019/20. Despite the possibility of India falling short of its 'pie in the sky' ambition of 175GW renewable energy (36% of total installed capacity) by FY2021/22, its commitment to embrace a low-cost, deflationary, low-emission and increasingly domestic-based electricity system is commendable.

Figure 3: India's TPP vs. Renewable Energy Capacity Additions Until FY2021/22



Source: CEA, MNRE, IEEFA estimates.

The long-term Indian electricity sector transition is well underway and supported by economics and global capital flows. India's coal-fired capacity expansion has already declined to just 3-4GW of annual net additions, down 80% from activity just three years ago.

Ongoing reliance on domestic coal-fired power is a 'necessary evil' for the medium term in India to keep the lights on for a giant economy that is targeting sustained 7-8% annual GDP growth.

A successful resolution of some of the near 96GW of proposed new coal-fired power plant capacity still stuck in the planning, approval and construction phases is equally necessary to ensure and facilitate the retirement of 40-50GW of approaching end-of-life polluting thermal power plants.

For India to reverse the trend of over 20GW of annual thermal power capacity additions in the first half of this decade and be able to exit the decade with 20-40 GW of annual renewable energy additions, would provide the world with a shining example for others to emulate.

About IEEFA

The Institute for Energy Economics and Financial Analysis conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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