

# Ready for Renewables

Industry leaders discuss transmission planning

The lack of adequate transmission infrastructure has long been a key issue plaguing renewable energy development in the country. The issue is more pronounced for large utility-scale projects that are deployed far from load centres, and need new transmission systems to be constructed to transport the clean energy they generate. Although steps have been taken by government agencies to allocate capacities and streamline permits and the time-consuming approval process, certain challenges still remain. These issues, if not addressed urgently, are likely to be magnified as India moves towards the deployment of 500 GW of clean energy by 2030. Against this backdrop, leading private transmission sector players discuss their key concerns, positive government initiatives and the way forward...

## What is the reason for transmission constraints on new renewable energy projects?



**Manish Agarwal,**  
Director and CEO,  
India Transmission,  
Starlite Power

India's existing power generation portfolio is the world's third largest, at nearly 360 GW. As part of the country's long-term decarbonisation effort, our prime minister, Narendra Modi, has pledged to add 500 GW of non-fossil generating resources by 2030. The country aims to meet 50 per cent of its energy requirements via renewables and reduce the emission intensity of its gross domestic product by 45 per cent, by 2030. There is an urgent need to double the pace of renewable energy generation in the next few years, in tandem with the development of robust and resilient grid infrastructure.

That said, the single biggest challenge arising from this huge influx of renewable energy into the grid is that huge generation capacities are being added much faster than evacuation systems can be built. Hence, transmission systems need to be planned much earlier than generation. Additionally, developing power transmission infrastructure is a bigger challenge than renewable power generation, as transmission is linear. Today, transmission systems need to come up within a stringent time frame of 18-24 months to meet

the pace of renewable energy generation. The challenge, then, is to build transmission lines that require the least right of way (RoW), commission them in matching time frames with renewable energy projects, and have enough capital available to facilitate the lowest possible cost of supply.



**Naveen Munjal, Director**  
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The Indian power sector is undergoing a significant change, with an aim to redefine the industry outlook. We have witnessed a massive transformation in India's renewables sector, making it a front runner to become one of the leaders in the global renewable space. Let's look at some notable reasons for the transmission constraints on new renewable energy projects.

First, renewable energy projects tend to be developed in areas that are resource-rich and have large tracts of land available. However, most of these areas are very remote, and far from the existing transmission infrastructure. Thus, transmis-

sion infrastructure needs to be beefed up substantially for the large magnitude of renewable energy that is being pumped or is proposed to be transmitted through the network. Wherever there are constraints on the existing infrastructure, preference is usually given to baseload thermal power.

Second, as the gestation periods of evacuation systems tend to be longer than those of renewable power projects, they tend to delay the setting up of renewable energy capacities, leading to constraints. To make matters worse, most greenfield transmission projects tend to get delayed on account of uncertainties around approvals such as those under Section 164 of the Electricity Act, forest clearances, RoW, land acquisition for substations, etc.

Third, the growth in intra-state transmission systems lacks the pace required to match the growth in renewable energy. Although the federal government, via its policy initiatives, such as Green Energy Corridor Phases I and II, has helped improve transmission infrastructure at the federal level, the states too need to open up the sector in order to catch up.

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The fourth is the time lag between the planning of a transmission system and the award of the contract for constructing the transmission asset. The central government is addressing this to a large extent through various initiatives such as the Central Electricity Authority (CEA) report on transmission planning for the proposed 500 GW of non-fossil capacity.

## What are the major issues faced by transmission developers in India? What needs to be done to address these challenges?

### Manish Agarwal

I would like to applaud the Ministry of Power's (MoP) decision to determine the construction period of interstate transmission systems after considering distance, voltage and the difficulty of implementing the project, including the type of terrain and the different clearances that need to be obtained. Currently, there are over 20 projects that have been identified for bidding under the tariff-based competitive bidding (TBCB) route, with construction timelines of 18-24 months. Given the extensive clearances and approvals required for the execution of such projects, the currently envisaged timelines for TBCB projects are not adequate.

The government has consistently been cognisant of the issues facing the sector and has proactively attempted to resolve them through game-changing initiatives such as Gati Shakti. This portal can help developers digitally identify the most optimal routes by showing the accurate locations of railway crossings, highways and other under-construction infrastructure projects. It can also identify the RoW permits and other permissions needed. This will not only save months of development time, but also facilitate cost efficiency by ensuring the right route is picked the first time. Further, creating a single window of approvals will be the single biggest enabler of project completion, making the sector attractive to global investors. Today, under the Department for Promotion of Industry and Internal Trade, a project monitoring group has been formed, which is doing good work in terms of

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resolving key issues with various stakeholders from the states.

Even then, recently, the centre red-flagged a decline in private investments in the country's infrastructure sector due to delays in land acquisition and clearance approvals for key projects. To address these challenges, it is critical that states implement land reforms and model policy frameworks on a war footing.

Moreover, to ensure that the sector remains vibrant and healthy for private players as well as the investor community, the bidding environment needs to be re-evaluated. Since price is the only barrier to entry for TBCB projects, important determinants such as technological know-how, prior experience and a strong track record are taking a back seat in favour of the lowest bidder. Reverse auctions may be triggered in specific cases, if not completely done

away with. If this issue is not addressed in time, significant downside risks will remain for the expected future transmission investments of Rs 2.5 trillion.

### Naveen Munjal

One of the key issues faced by transmission developers in India is the limited number of credible manufacturers of geographic information system (GIS) and extra high voltage equipment, which causes supply-side constraints and impacts the timely completion of projects as well as competitive pricing. This has, in part, been addressed by the government by way of easing entry barriers and providing incentives for setting up manufacturing facilities more focused approach in incentivising equipment industry and matching prizes with the industry capacity will alleviate this concern.

Another area of concern is the inherent is-





issues related to RoW and land acquisition, which are exacerbated by increasing urbanisation/commercialisation and have been the main cause of time and cost overruns in transmission projects. While the federal government has taken several steps to address some of these challenges, a lot more still needs to be done at the ground level. Some states have still not adopted the government's guidelines for payment of RoW compensations, nor have they notified their own. Moreover, lack of clarity regarding the policy framework and lack of coordination between the state and federal agencies are other areas of concern which result in disputes/litigation during the execution stage, impacting project implementation schedules. More investment and competitive tariffs can be encouraged by taking requisite steps in these areas.

Yet another area of concern is reverse auctions, which were introduced a few years ago. This has led developers to take unnecessary risks and make aggressive assumptions, thereby putting at risk the entire 500 GW target. In line with the wind segment, reverse auctions need to be dispensed with at the earliest.

#### Does the CEA's recent report on transmission planning for 500 GW of renewables address the current gaps?

**Manish Agarwal**

It is important to applaud the MoP's initiative to launch a clear transmission roadmap for the deployment of 500 GW of renewable energy. As per the roadmap, the planned additional transmission systems required for having 500 GW of non-fossil fuel capacity consist of 50,890 ckm. of transmission lines, including 6,500 ckm. of HVDC transmission corridors, at an estimated cost of Rs 2.5 trillion. Half of these investments are expected to trickle in by 2026. This is indeed an incredible opportunity for the industry.

Undoubtedly, the roadmap for transmission will be a major boost to India's energy transition. It is an incredible step not only for the power transmission industry but also for the investor community. Therefore, the right push to key areas will enable India to make good on its renewable energy and net zero promises.

**Naveen Munjal**

The efforts of the CEA for producing this

report on building a transmission system by 2030 that would meet the power flow requirements for renewable energy sources linked to renewable energy zones, hydro power plants and green hydrogen production, are highly appreciated. Some very pertinent issues that remain unaddressed are:

- The limited number of reputable manufacturers of power transformers and GIS equipment, which results in long waiting periods and possibly impacts the completion of projects within stipulated timelines. If multiple projects need to be executed contemporaneously, delays in delivery of equipment could pose a serious challenge for project execution.
- Similarly, just a couple of EPC players are available for substation and transmission lines at the 765 kV voltage level. Considering the projects that are likely to come up at the 765 kV level, many more suppliers are needed, not just to cope with the load and timelines but also to address monopolistic pricing.

Given the ambitious targets, it is desirable to address the above limitations on priority, to help all stakeholders. ■



## Green Open Access

Challenges and opportunities in the growing C&I market

By Sushmita R. Ajwani, Director, Power and Renewables, ICF International

The commercial and industrial (C&I) segment consumes around 665 billion units of electricity annually, which is more than 50 per cent of the total consumption in India. Owing to the steady economic growth of the country, power consumption in this segment has grown by 5 per cent in the past 10 years. However, the perennial challenge faced by the C&I segment is the rising price of power, which has significantly impacted profitability. The genesis of this challenge lies in the fundamentals of the tariff structuring methodology of discoms, where cost distribution is not uniform across consumers. Historically, to reduce the cost burden of the agrarian community, electricity used in the sector has been overly subsidised. To eliminate the

cost arising due to the subsidised tariff, industries and commercial establishments were made to pay the premium. In the past 10 years, the demand charges of most industrialised states have increased, such as in Maharashtra and Gujarat by 8 per cent and 3 per cent respectively.

To control the impact of this incessant increase in grid tariff, many power-intensive industries have turned to safe havens in captive thermal power plants (TPPs), reducing their cost from Rs 9 per kWh to Rs 3-3.30 per kWh. However, not all industries could take this route, as that their power requirement was inadequate to support the cost associated with setting up captive units. Further, in today's sce-

nario, captive TPPs are not seen as an environmentally sustainable option. The realm of procurement of power from sources other than the grid opened up in 2003 as "open access". Initially it was welcomed and discoms extended various incentives to encourage consumers to switch to alternative modes. Many consumers switched to short-term power markets and third-party power procurement with a lock-in period of three to five years. Tamil Nadu and Karnataka experience the maximum exodus of C&I consumer open access routes.

Gradually, as the volume of open access increased, discoms started experiencing revenue drain, which was key deterrent

