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Challenges in India's Tender-Driven Renewable Energy Market

Despite record-high utility-scale renewable energy tender issuances in 2024, ongoing issues with project execution could deter investor interest.

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Key Findings

Powered by India's annual bidding plan, a record 73 gigawatts (GW) of utility-scale renewable energy tenders were issued in 2024, with non-vanilla renewable technologies such as wind-solar hybrid and energy storage accounting for half of the issued capacity.

Since 2023, there has been a notable rise in post-bidding challenges of utility-scale renewable energy tenders, including undersubscription, delays in power agreement signings and cancellation.

Power developers argue that the strict mandate to meet an annual bidding target of 50GW puts pressure on tendering agencies to issue bids and finalise auctions without securing and planning for offtake agreements, delaying the signing of power agreements.

The significant backlog of power sale agreements from the Solar Energy Corporation of India (SECI) suggests a gradual shift in market share from SECI-led tenders to those directly invited by energy offtakers.

Executive Summary

India's utility-scale renewable energy tendering market is reaching new heights, with record-breaking issuances in 2023 and 2024. In 2024, the Ministry of New and Renewable Energy's (MNRE) annual bidding plan, which mandates a minimum of 50GW of tendered capacity each year, primarily drove cumulative tender issuance to a record-high 73 gigawatts (GW).

Both the issuance and allotment of tenders are increasingly focusing on non-traditional renewable energy technologies, indicating demand from energy offtakers for improved power quality. Based on tender allotments, wind-solar hybrid (WSH) surpassed solar power in 2024 to become the leading segment in utility-scale renewable energy tendering.

Recognising the market shift toward non-traditional renewable energy technologies, some developers are prioritising these segments to establish a niche. For example, new entrants like IndiGrid and Gensol focus primarily on standalone storage tenders. Meanwhile, Hexa Climate has secured all its capacity so far in firm and dispatchable renewable energy (FDRE) tenders.

Following the significant increase in renewable energy tendering and allotments after 2022, there has also been a notable rise in challenges related to the execution of utility-scale renewable energy projects, resulting in three interconnected outcomes:

- **Tender undersubscription**: In 2024, approximately 8.5GW of capacity in utility-scale renewable energy tenders was undersubscribed, five times higher than the undersubscription in 2023. This trend can be attributed to several factors, including complex tender designs (such as demand following FDRE), aggressive bidding during reverse auctions, and delays in the readiness of interstate transmission system (ISTS) infrastructure.

- **Delays in power agreements with energy offtakers:** Industry stakeholders report that India's cumulative unsigned power sale agreement (PSA) capacity has exceeded 40GW,[1] with Solar Energy Corporation of India (SECI) tenders alone accounting for about 12GW. The primary reason for the delays in signing these PSAs appears to be the expectation from energy offtakers of continuously falling renewable energy tariffs. The delay may also stem from the additional time required for state distribution companies (DISCOMs) to obtain internal approvals from state governments and electricity regulators to adopt the tariffs discovered. Power developers argue that the strict mandate to meet an annual bidding target of 50GW puts pressure on renewable energy implementing agencies (REIAs) to issue bids and finalise auctions without securing and planning for offtake agreements.

[1]Business Standard. Renewable energy projects of 40 GW fail to find buyers for green power. 26 February 2025.

- **Tender cancellations:** From 2020 to 2024, 38.3GW of utility-scale renewable energy capacity was cancelled, accounting for about 19% of the total issued capacity during that period. Tender cancellations can occur at any stage of the bidding process, either before or after auctions. Cancellations before auctions typically happen when authorities identify substantial challenges related to tender design, location or technical complexity, based on feedback from industry stakeholders following the issuance of the request for selection (RfS). Significant causes of cancellations after auctions include undersubscription and PSA delays.

Delays in project implementation pose a significant challenge to India's renewable energy target for 2030. Ongoing issues with project realisation could deter investor interest in future renewable energy projects in India, potentially affecting the availability of low-cost financing from overseas large-scale investors. Until there is clarity on clearing the unsold power inventory, independent power producers (IPPs) may hesitate to bid for new large-scale projects. According to JMK Research, these challenges in project realisation could cumulatively affect 75GW of utility-scale renewable energy capacity tendered by 2030.

The significant backlog of PSAs from SECI suggests a gradual shift in market share from SECI-led tenders to those directly invited by energy offtakers. Developers highlight that tenders facilitated by offtakers often lead to quicker PSA signings, as there is no intermediary agency involved.

For viable growth of the renewable energy tendering market, the government must focus equally on all aspects of the tendering process, from the issuance of RfSs to allotment and signing of PSAs. In addition to issuing tenders, the government should establish annual targets for both allotments and the execution of PSAs. This will ensure that REIAs issue bids only after securing the necessary offtake agreements. Furthermore, stricter enforcement of renewable purchase obligations and associated penalties is essential to sustain renewable energy demand.

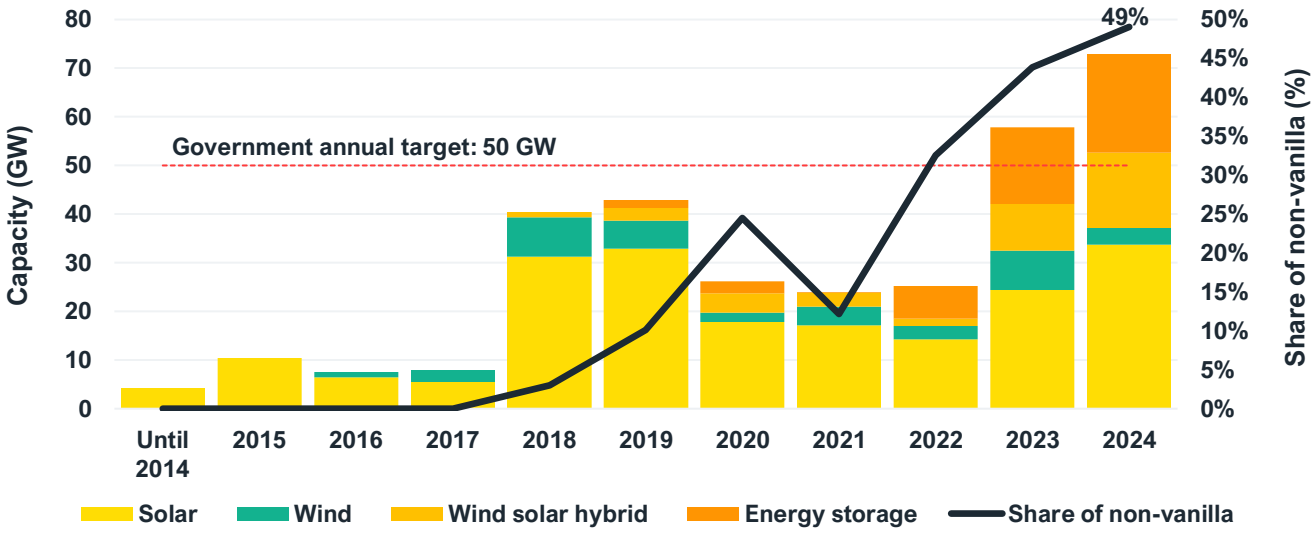
India's Renewable Energy Tendering Landscape

Issuance

In the decade from 2014, utility-scale renewable energy tenders were a key driver of market growth in India. Initially focused on simple "vanilla" solar projects, the government has expanded its tender portfolio over the years to include a variety of renewable energy technologies, such as wind, wind-solar hybrid (WSH) and energy storage systems (ESS).

In 2024, India's tendering agencies issued a record-breaking cumulative capacity of about 73GW utility-scale renewable energy tenders. The average capacity of renewable energy tenders has been steadily increasing, growing by 25% in 2024 compared with 2023 to reach nearly 1GW per tender. With energy offtakers focusing more on power output quality, the share of non-vanilla renewable energy tenders (including WSH and ESS) surpassed 49% in 2024.

Figure 1: Renewable Energy Tender Issuance, Annual Trend



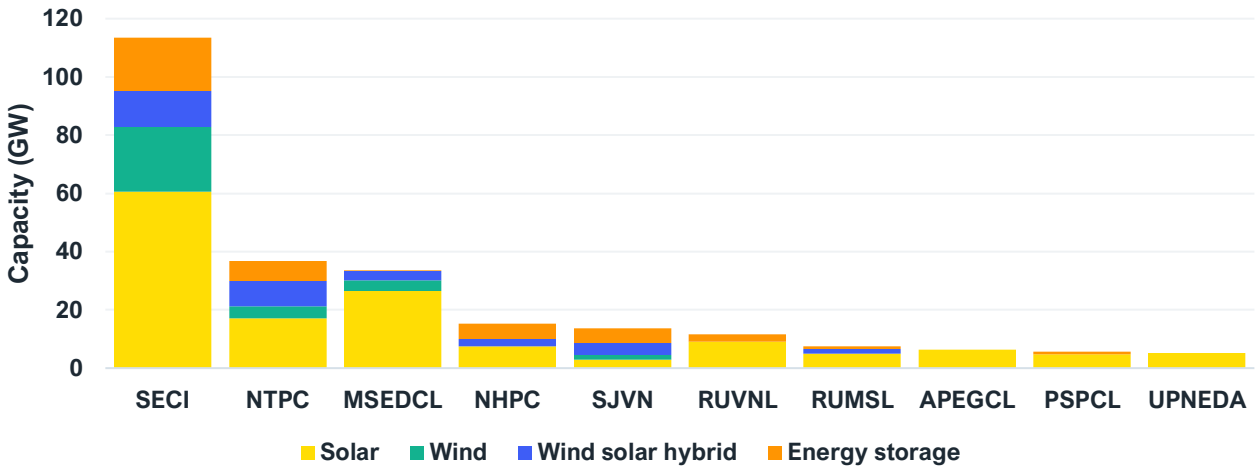
Source: JMK Research database

Note: Energy storage capacity includes WSH (with storage), Solar + ESS and firm and dispatchable renewable energy (FDRE). It does not include standalone storage.

To accelerate the deployment of renewable energy and meet its target of 500 gigawatts (GW) by 2030, the Ministry of New and Renewable Energy (MNRE) has established an annual bidding plan,

starting from March 2023 until the fiscal year (FY) 2028.[2] The MNRE has designated four organisations as renewable energy implementing agencies (REIAs): Solar Energy Corporation of India (SECI), NTPC Ltd, SJVN and NHPC Ltd. The central government set an annual tendering goal of 50GW distributed among these REIAs. This approach led to a record number of renewable energy tenders being issued in 2023 and 2024.

Figure 2: Renewable Energy Tender Issuance Capacity by Indian Agencies (as of December 2024)



Source: JMK Research database

Note: Energy storage capacity includes WSH (with storage), Solar + ESS and firm and dispatchable renewable energy (FDRE). It does not include standalone storage.

SECI has established itself as India's largest utility-scale renewable energy tendering agency. As of December 2024, it had issued more than 113GW of tenders, three times the amount issued by NTPC Ltd, the second-largest issuer. In addition to the central agencies, state agencies such as Maharashtra State Electricity Distribution Co. Ltd (MSEDCL), Rajasthan Urja Vikas Nigam Ltd (RUVNL) and Rewa Ultra Mega Solar Ltd (RUMSL) have also played significant roles in issuing considerable capacities, becoming key players in India's renewable energy tendering landscape. Like REIAs, state agencies are also emphasising non-vanilla tendering.

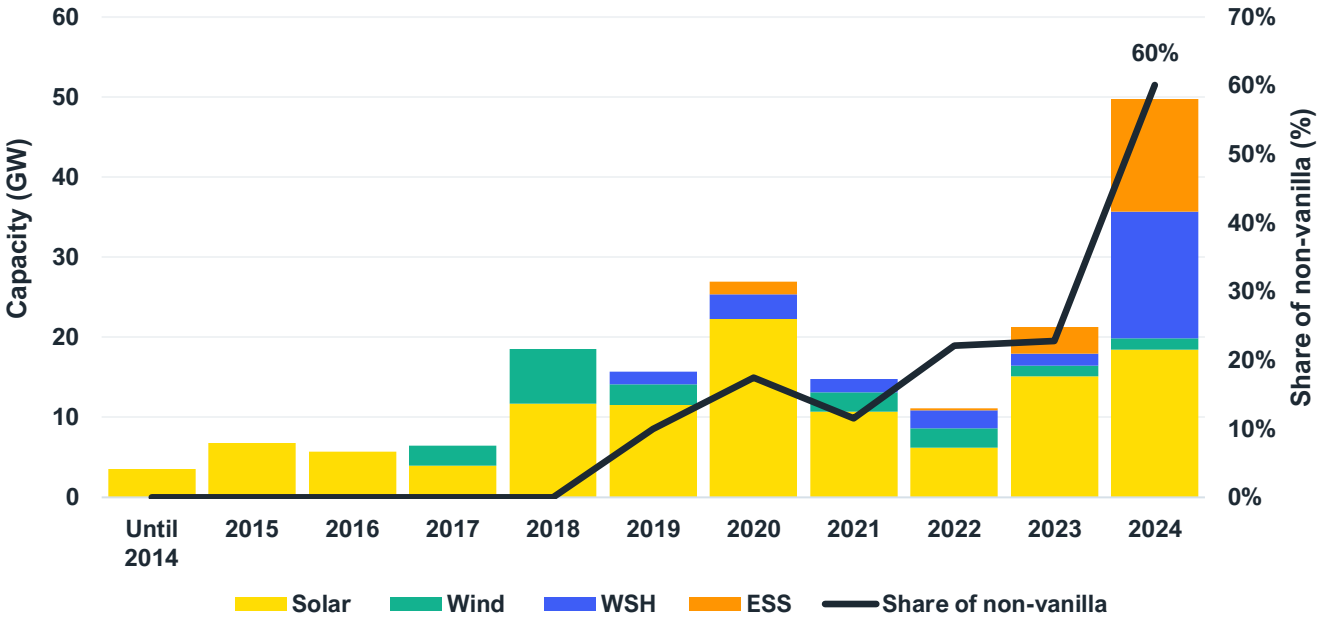
Allotment

Since 2023, tender issuance has significantly increased, leading to a substantial rise in allotments. Between 2023 and 2024, the annual allotted capacity more than doubled to about 50GW. Tenders focused on non-vanilla renewable energy technologies drove this record level of tender allotment in

[2] Press Information Bureau. Government declares plan to add 50 GW of renewable energy capacity annually for next 5 years to achieve the target of 500 GW by 2030. 5 April 2023.

2024. Their share of tender allotments increased from 23% in 2023 to 60% in 2024, signalling growing demand from energy offtakers for these types of tenders.

Figure 3: Renewable Energy Tender Allotment, Annual Trend



Source: JMK Research database

Note: Energy storage capacity includes WSH (with storage), Solar + ESS and firm and dispatchable renewable energy (FDRE). It does not include standalone storage.

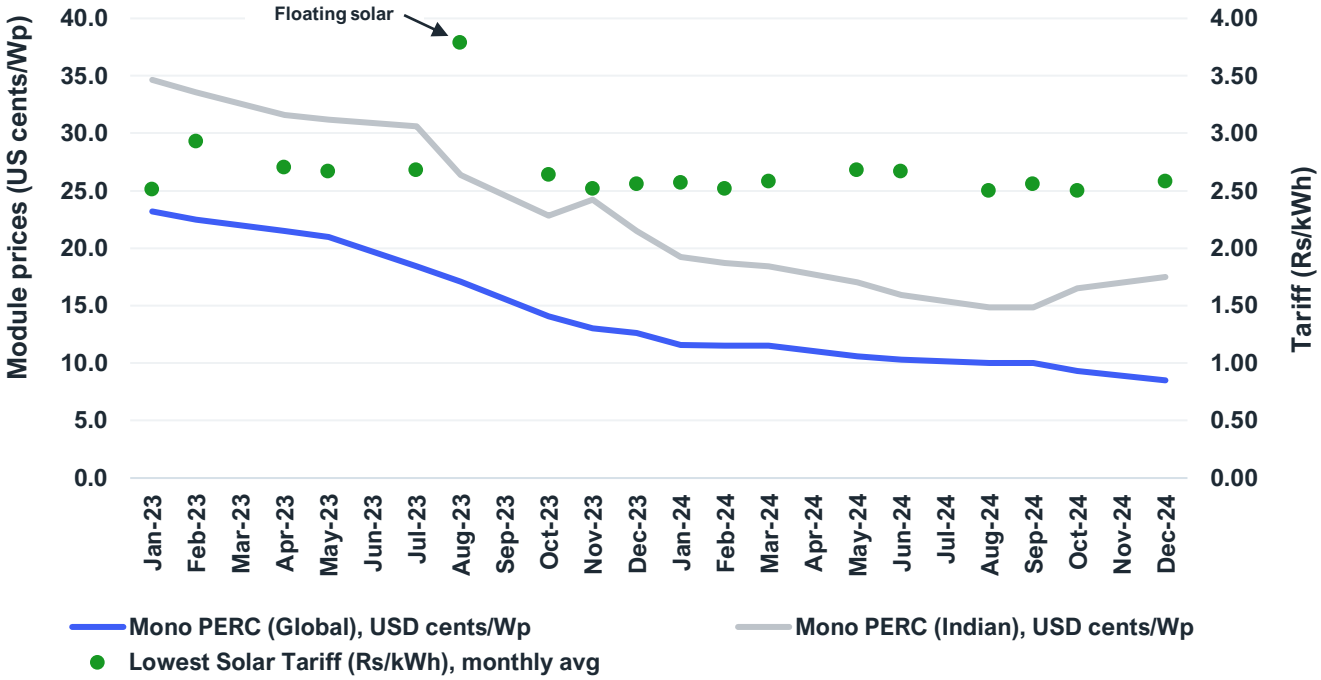
In 2024, the WSH segment experienced the highest growth in annual tender allotments within the utility-scale renewable energy market. With more than 15GW of allotments, it surpassed solar energy, becoming the largest utility-scale renewable energy market segment that year. In the non-vanilla market landscape, WSH offers the best balance of improved power output while adding minimal technological complexity. In contrast, the ESS market is still evolving. Its tender designs and targeted solutions are in development, which sometimes results in cancellations and delays in signing power agreements. Upcoming sections will discuss these topics in detail.

Tariff Trends

In 2023 and 2024, solar module prices in both the global and domestic markets declined by 63% and 78%, respectively. In December 2024, the cost of a solar module manufactured in India was US¢20.2 per Watt-peak (Wp) output, more than double the price in global markets, i.e. US¢8.5/Wp.[3]

[3] Based on weekly issued PV spot prices by InfoLink Consulting. December 2024.

Figure 4: Utility-scale Solar Tariff Trends (January 2023 – December 2024)



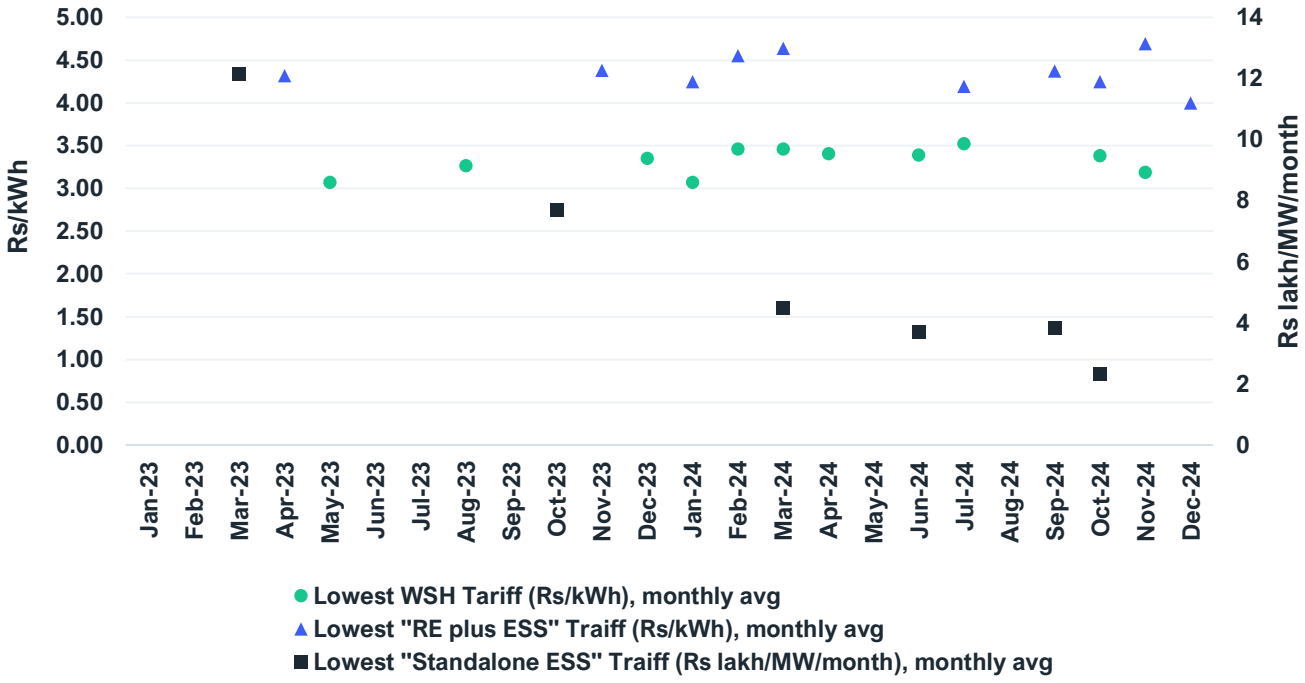
Source: JMK Research Database

While solar module prices are dropping significantly, solar tender tariffs haven't had a corresponding decrease and remained in the Rs 2.5-2.7 per kilowatt hour (kWh) range in those two years. The probable reasons for module prices not yet translating to lower tariffs are:

- The imposition of the Approved List of Models and Manufacturers (ALMM) from April 2024 kept procurement costs elevated as developers quoting in bids after mid-2023 had to factor in higher domestic module costs. In addition, procurement delays due to the limited availability of the ALMM-designated module until mid-2024 contributed to the elevated tariff profile.
- Other challenges, such as an unstable supply chain and the depreciation of the Indian rupee against the US dollar, have impeded the ability to translate the decrease in module prices into lower tariffs.

WSH tariffs are affected by concurrent cost trends from the solar and wind sectors. While solar tariffs have remained marginally high, wind tariffs have risen substantially, marking a rise in WSH tenders with the highest tariff discovery of Rs3.52 (US¢4)/kWh.

Figure 5: Utility-scale Non-solar Tariff Trends (January 2023 – December 2024)



Source: JMK Research Database

The decline in battery prices is contributing to the decrease in ESS-based tariffs. Battery prices fell by 31% from 2022 to 2024.[4] This decline is due to a record five-year low in metal prices, and technological advancements. Hence, the equivalent lowest tariffs in standalone battery + ESS (BESS) tenders dropped from Rs9/kWh (US¢10/kWh) in 2022 to Rs3.52/kWh (US¢4/kWh) in December 2024.

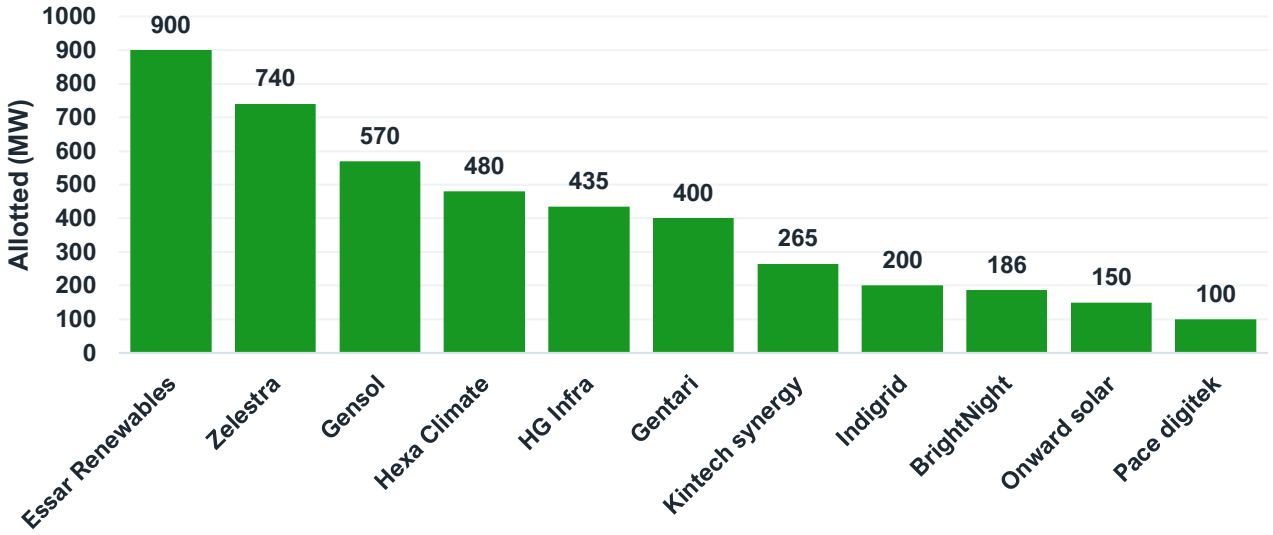
New Market Entrants

Essar Group is the latest multinational conglomerate to enter India's renewable energy tendering market. Essar Renewables won 900 megawatts (MW) capacity in 2024, 300MW of which is from an ESS tender. It joins other foreign IPPs entering India's utility-scale renewable energy market, such as BrightNight (US) and Zelestra (Spain), which have won a cumulative capacity of more than 900MW. Gentari, the global renewables arm of Malaysia-based Petronas, also won a capacity of 400MW in an SJVN 1200MW WSH tender issued in 2024. Hexa Climate, powered by a US$500 million (Rs43.5 billion) investment from I Squared Capital,[5] forayed into utility-scale renewable energy tenders in

[4] BloombergNEF. Lithium-Ion Battery Pack Prices See Largest Drop Since 2017, Falling to $115 per Kilowatt-Hour. 10 December 2024.
[5] Mint. Amplus founder, I Squared Capital set up Hexa Climate Solutions. 30 October 2023.

2024, winning 480MW capacity in firm and dispatchable renewable energy (FDRE)-based ESS tenders.

Figure 6: New Entrants to India's Utility-scale Renewable Energy Tendering (2024)



Source: JMK Research database

Some new entrants, such as IndiGrid and Gensol, are primarily focusing on standalone BESS tenders. In 2024, entities from other sectors also won renewable energy tenders. These included HG Infra Engineering (a road engineering, procurement and construction company), Pace Digitek (a telecommunications company) and NRC Industries (a conveyor belt manufacturer).

Project Realisation Challenges

Following the significant increase in renewable energy tendering and allotment after 2022, there has also been a notable rise in challenges related to the realisation of utility-scale projects. These challenges vary from complex tender designs to insufficient power evacuation infrastructure. If the stakeholders involved in the tendering process do not address these issues properly, they can lead to three interconnected outcomes:

- Tender undersubscription
- Delays in power agreement signing with energy offtakers
- Tender cancellation

The upcoming sections will detail these outcomes, outlining their causes and ways to address them. The matrix below briefly describes each challenge and its likely direct impact on tender realisation.

Table 1: Issues Affecting Project Realisation of Utility-scale Renewable Energy Tenders

Title	Description	Leading to ->		
		Undersubscription	Delay in power agreement signing	Cancellation
Financial pre-requisites	Stringent financial prerequisites such as high bank guarantees and financial closure deadlines	■		
Land prices and availability	Stringent commercially useful function (CUF) requirements in tenders push up land prices in high-irradiance locations	■	■	
Power evacuation infrastructure	ISTS transmission infrastructure is overstressed, with a shortage of connectivity margin at ISTS substations	■		
Policy irregularity	Policy irregularities include ALMM imposition, ISTS waiver expiration, renewable energy development fee (RDEF), etc.	■	■	
Aggressive bidding	Aggressive bidding by renewable energy developers during reverse auctions may lead to inaccurate tariff discovery	■		■
Tender design	Challenging power delivery requirements, solution complexity and unfavourable tender types inhibit market participation	■	■	■
Offtaker backout	Energy offtakers (DISCOMs) may back out of the tendering process after allotment		■	■
Falling tariffs	Anticipation of reduced tariffs will hinder the project realisation of concluded renewable energy tenders		■	■

Source: JMK Research

Undersubscription in Renewable Energy Tenders

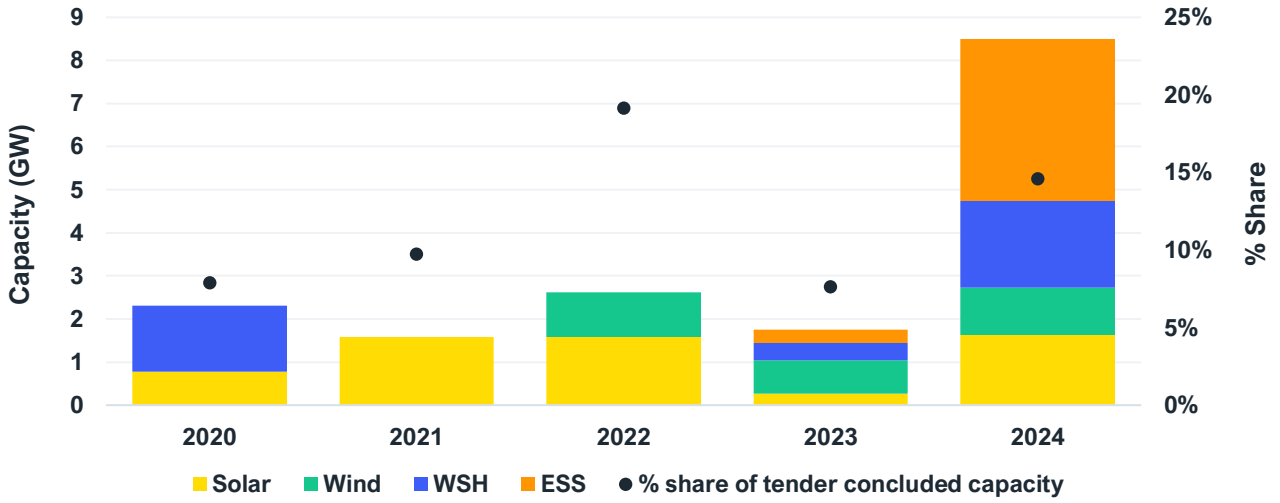
A tender is considered "undersubscribed" when the awarded capacity is less than the capacity tendered. In 2024, approximately 8.5GW of capacity in utility-scale renewable energy tenders was under-subscribed, five times higher than in 2023.

With about 44% of the total, ESS tenders represent the largest share of this undersubscribed capacity. Most of this capacity comes from FDRE tenders, which entered India's renewable energy tendering landscape in 2023. The design of FDRE tenders is still evolving, and tendering authorities

are working to establish the best parameters that balance developers' capabilities with the demands of energy offtakers.

There has been a noticeable decrease in the issuance of demand profile following FDRE tenders due to their stringent power delivery, availability conditions and solution complexity. Instead, FDRE tenders are shifting their focus to ensuring power availability for energy offtakers during peak hours.

Figure 7: Renewable Energy Tender Undersubscription, Annual Trend



Source: JMK Research database

Note: Energy storage capacity includes WSH (with storage), Solar + ESS and firm and dispatchable renewable energy (FDRE). It does not include standalone storage.

Aggressive bidding in time-constrained environments, such as reverse auctions, can lead to undersubscription of tenders, resulting in unrealistic tariff discoveries. When other bidders cannot meet these tariffs, a significant portion of bid capacity remains unawarded.

Additionally, stringent financial prerequisites, such as high bank guarantees against earnest money deposits (EMD), requirements for financial closure[6] and performance guarantees, can discourage developer participation in tender auctions. This issue is particularly evident in ESS tenders, where bank guarantees are considerably higher than other renewable energy tender types. For instance, in the SECI FDRE-II tender, the performance bank guarantee was approximately Rs3.4 million (US$39,000)/MW, at least 45% more than for a corresponding solar tender from SECI.

Furthermore, for ISTS-based utility-scale renewable energy tenders, delays in the readiness of the ISTS transmission infrastructure are raising concerns among developers. Without sufficient transmission system availability at the central transmission utility (CTU) level to align with PPA

[6] Financial closure in renewable energy projects is when all the conditions for financing are met, and the project can begin construction.

timelines of 18-24 months, developers are becoming increasingly cautious about bidding on new projects, leading to further undersubscription.

SECI Power Sale Agreement Issues with Utilities

SECI is the leading tendering authority in India for the development of utility-scale renewable energy projects. It issues tenders on a national or state-specific basis. Once the bidding process concludes, followed by a reverse auction, SECI typically signs power purchase agreements (PPAs) with developers and establishes power sale agreements (PSAs) with energy offtakers, such as state electricity distribution companies (DISCOMs).

According to the Ministry of Power's guidelines for the tariff-based competitive bidding process, the entire procedure – from issuing the request for selection (RfS) to signing power agreements – should generally take about 140 days.[7] Additionally, SECI must facilitate the signing of power agreements (both PPAs and PSAs) within 40 days following the conclusion of reverse auctions. If signing the PPA or PSA for the entire or part of the allotted capacity is delayed beyond this timeline, it is usually referred to as unsold power.

Figure 8: Indicative Timeline of SECI Tender Bidding Process

Source: SECI

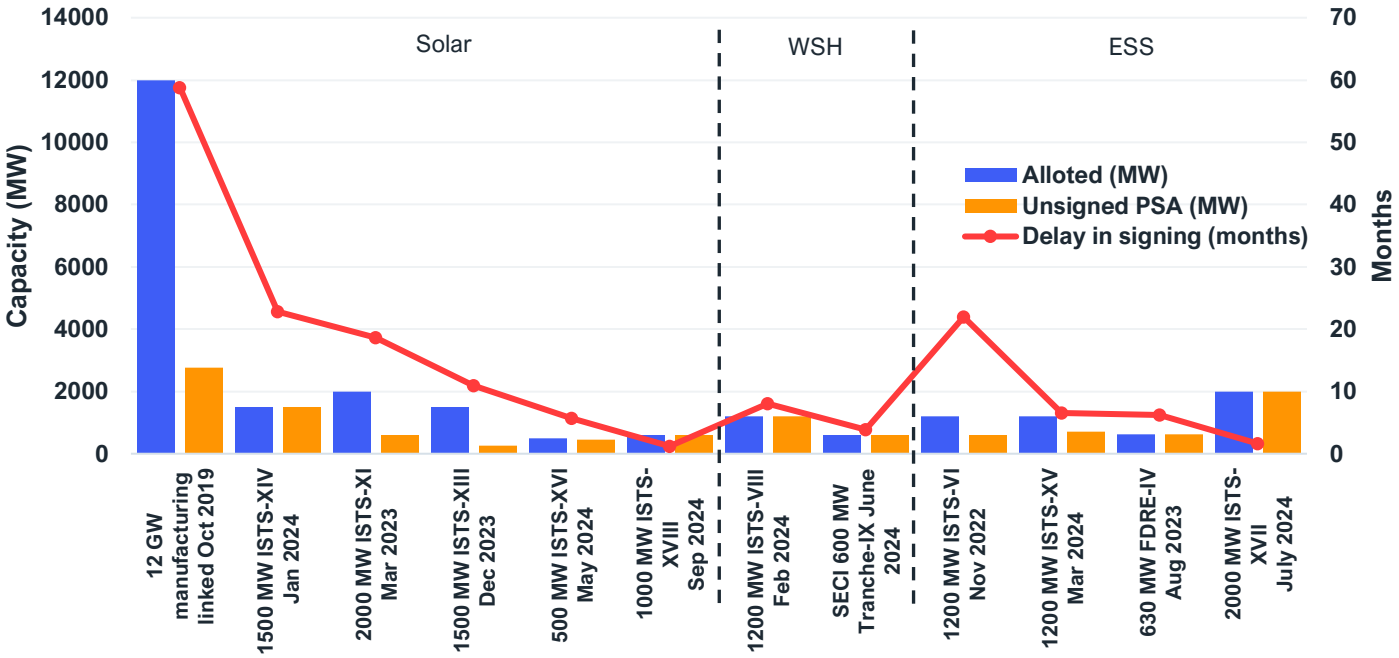
As of 21 January 2025, about 11.8GW of capacity from SECI's 12 renewable energy tenders – comprising solar, wind-solar hybrid and storage projects – remains on hold due to delays in PSA signing. More than half of this unsigned capacity comes from solar and solar (manufacturing-linked) tenders, and ESS-based tenders account for more than 30% of the total unsigned capacity.

Among all the tenders, SECI's largest solar tender, which has a capacity of 12GW and includes a manufacturing-linked component, holds the highest amount of unsigned PSA capacity at 2,766MW. This tender has also experienced the longest delay in PSA signing, approaching five years since the auction allotment in April 2020. The significant solar tariff of Rs2.92/kWh (US¢3.3/kWh), combined with the project's large size, has led to DISCOMs' reluctance to execute a long-term PSA. To make the tariff more attractive, SECI intervened in September 2020, bundling this tariff with other prevailing solar tariffs, which reduced the resultant tariff to Rs2.42/kWh (US¢2.8/kWh).

[7] Ministry of Power. Guidelines for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Solar PV Power Projects. July 2023.

In addition to SECI, other tendering agencies are also experiencing delays in signing PSAs with offtakers. According to industry stakeholders, India's cumulative unsigned PSA capacity has exceeded 40GW.[8]

Figure 9: SECI Concluded Tenders with Unsigned PSAs (as of January 2025)



Sources: SECI, JMK Research database

Note: Energy storage capacity includes WSH (with storage), Solar + ESS and firm and dispatchable renewable energy (FDRE). It does not include standalone storage.

Industry stakeholders believe the primary reason for the delay in signing PSAs is the expectation of continuously falling renewable energy tariffs from energy offtakers. Any tender price discovery that offtakers, particularly the financially strained state DISCOMs, view as higher than average creates a reluctance to enter into long-term PSAs. Furthermore, the delay may also stem from the additional time required for state DISCOMs to obtain internal approvals from state governments and electricity regulators to adopt the discovered tariffs.

The impending expiration of the complete ISTS waivers in June 2025 is also causing concern. State utilities hope for an extension of these waivers, making them hesitant to commit to long-term PSAs until any extension is clarified.

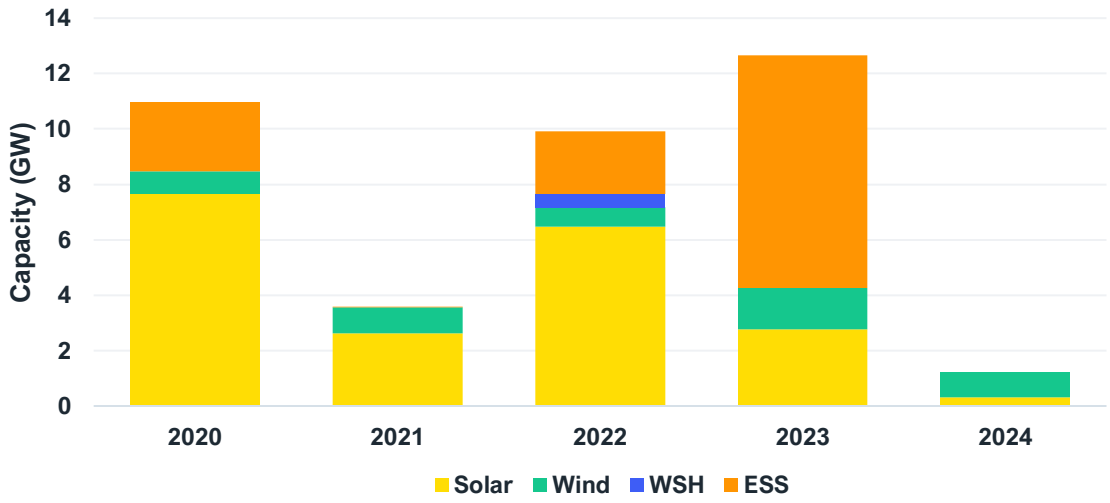
[8] Business Standard. Renewable energy projects of 40 GW fail to find buyers for green power. 26 February 2025.

According to the central government, the rise in unsold capacity is temporary as the market adjusts to the significant influx of tendered capacity following the announcement of a 50GW annual bidding trajectory. In contrast, power developers argue that the strict mandate to meet this annual bidding trajectory pressures REIAs to issue bids and finalise auctions without securing and planning for offtake agreements.

Tender Cancellations

From 2020 to 2024, a total of 38.3GW of utility-scale renewable energy capacity was cancelled. This represents about 19% of the cumulative RfS issued capacity during the same period. Tender cancellations peaked in 2023, with ESS-based renewable energy tenders accounting for two-thirds of the cancelled capacity.

Figure 10: Utility-scale Renewable Energy Tender Cancellations, Annual Trend

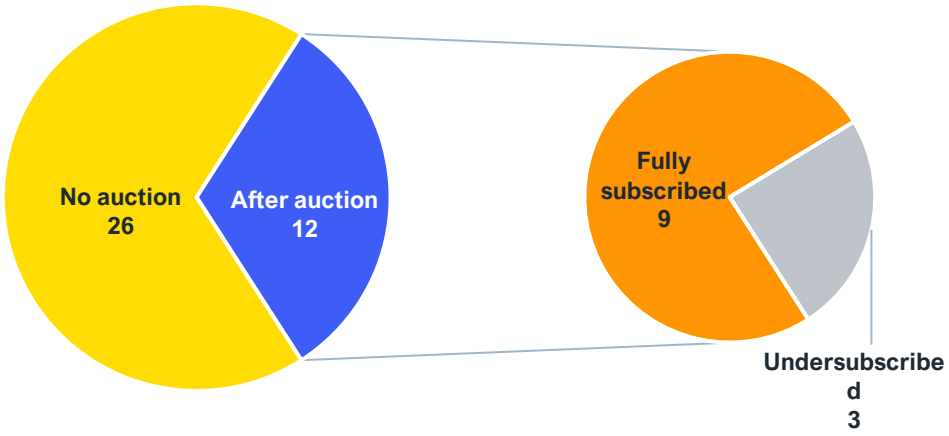


Source: JMK Research database

Note: Energy storage capacity includes WSH (with storage), Solar + ESS and firm and dispatchable renewable energy (FDRE). It does not include standalone storage.

Tender cancellations can happen at any point in the bidding process, including before or after auctions. From 2020 to 2024, about 32% of the capacity offered was cancelled after the auction, with three-quarters of these tenders fully subscribed.

Figure 11: Utility-scale Tender Cancellations, by Auction Status (2020-2024), GW



Source: JMK Research database

Tenders are often cancelled after their auctions due to undersubscription, delays in signing the PSA and other issues discussed in this report. When a tender is cancelled before the auction, it is typically the tendering authorities' decision. This usually occurs when the authorities identify significant problems with the tender design, location or technical complexity based on feedback from industry stakeholders following the issuance of the RfS.

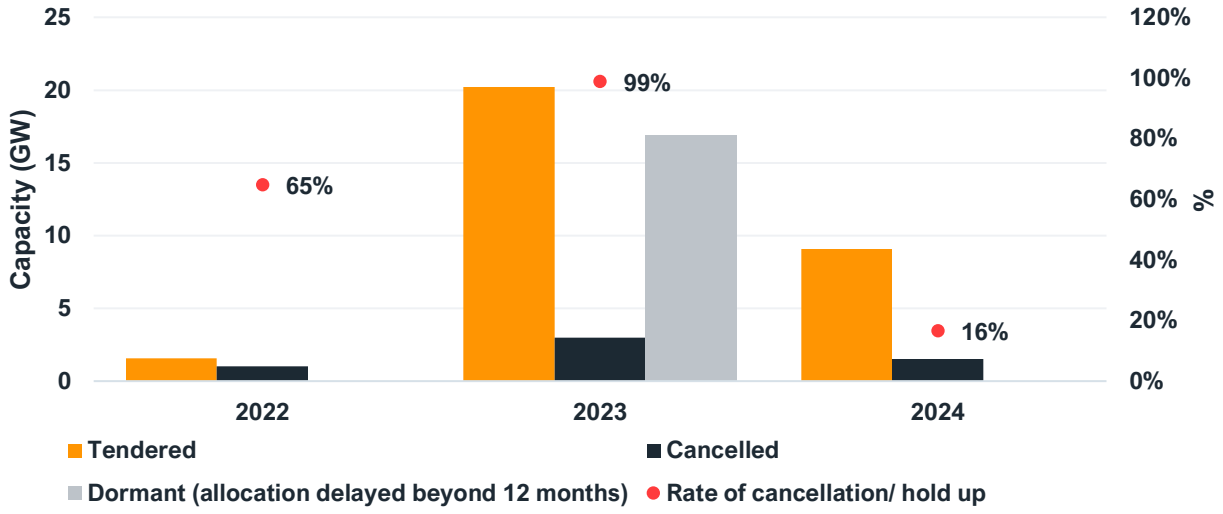
For instance, in 2021, SECI cancelled a 7.5GW solar tender that required developers to establish solar projects and evacuation transmission infrastructure from Leh and Kargil in Ladakh. Only a few developers in India possess the technical and financial capability to execute such a large-scale project.

Standalone ESS Projects Bottleneck

Akin to its name, a standalone ESS project only consists of the ESS without any renewable energy component such as solar or wind. The developer's scope is only to supply and maintain the ESS in exchange for a fixed monthly or annual fee. Charging and discharging ESS are generally handled by the tendering authority.

Despite the absence of a renewable energy component, all standalone ESS tenders mandate charging the ESS with a renewable energy source, indirectly contributing to India's renewable energy market development. Standalone ESS tenders issued by tendering authorities are based on battery + ESS (BESS) or pumped hydro storage (PHS).

Figure 12: Standalone ESS Cancellations, Annual Trend



Source: JMK Research database

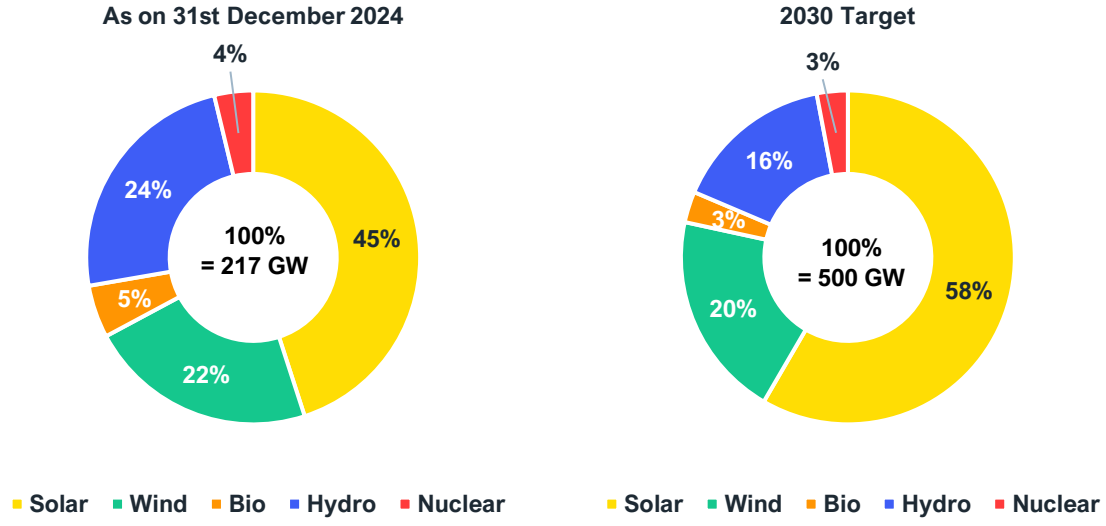
The first tender for standalone ESS was issued in 2022. By 2024, 30.8GW of capacity had been issued, of which about 22.4GW had been cancelled or shelved. Novel tender designs leading to auction, PSA, PPA signing delays and challenges related to site selection for PHS projects are the primary reasons for this trend. In 2023, RUMSL issued one such tender for 16.4GW of PHS capacity in Madhya Pradesh. This tender has been suspended while the tendering authority resolves issues related to site identification and land acquisition, and it will probably be revised. Other issues, including fake bank guarantees, caused the cancellation of a standalone ESS tender in 2024.[9]

Impact on India's 2030 Renewable Energy Target

As part of national determined contribution (NDC) targets, India has committed to set up 500GW of renewable energy capacity by 2030. Therefore, from 2025 to 2030, India must add at least 246GW, or about 41GW a year, of solar and wind capacity to meet its target. This will require a concerted effort from all stakeholders to address project realisation challenges and a sustained tendering momentum for the next few years.

[9] PV Magazine. Anil Ambani's Reliance Power debarred from participating in SECI's tenders for three years. 7 November 2024.

Figure 13: India's 2030 Renewable Energy Target, by Technology



Source: JMK Research database

Undersubscription, power agreement signing delays and cancellations create a vicious cycle with multifaceted impacts on the renewable energy sector in India:

- Investment inflow: The trend of delays in PSA signing and cancellations in 2023 and 2024 can deter investor interest in future Indian renewable energy projects. This effect is exaggerated when projects encounter difficulties. For example, in November 2024, US authorities alleged bribery by the developers in SECI's 12GW solar-linked manufacturing tender to expedite the PSA signing.[10] This shone an unfavourable spotlight on India's renewable energy market, which some stakeholders believe could affect the availability and accessibility of low-cost overseas financing from large-scale investors.
- Developer interest: PSA signing delays and cancellations have caused significant unrest among developers, who are increasingly cautious when bidding for utility-scale renewable energy tenders. About 20 developers, including Adani, NTPC, JSW Energy, and ReNew, have SECI-tendered projects in their pipelines that have yet to reach PSA execution. Until there is visibility in clearing the unsold power inventory, independent power producers (IPPs) will be wary of bidding for new large-scale projects.

The delays in project implementation will pose a major challenge for India's long-term renewable energy target for 2030. In the long term, an RfS tendered capacity can have only two outcomes: it can either be commissioned or cancelled. From 2018 to 2023, the cancellation rate for the total RfS tendered capacity was 26.7%.

[10] Reuters. What the Adani allegations highlight about India's clean energy push. 28 November 2024.

Owing to the gap in tender issuance and transmission infrastructure, the average annual tender cancellation rate will rise marginally in the short term. However, with enhanced streamlining of the tendering process and transmission augmentations planned by the central government, the cancellation rate will stabilise in the closing years of the decade. JMK Research estimates the average annual tender cancellation rate until 2030 will be about 25%. Consequently, considering the yearly bidding trajectory of 50GW, project realisation challenges will cumulatively affect 75GW of utility-scale renewable energy tendered capacity until 2030.

Conclusion

The growth of utility-scale renewable energy tendering has surged significantly after 2022, reaching about 73GW in 2024, primarily driven by the central government's goal to auction at least 50GW of renewable energy projects annually. However, the ongoing issues of delays in PSA signings, undersubscriptions and cancellations in 2023 and 2024 have underscored the persistent challenges in realising utility-scale renewable energy projects.

Despite these challenges, the evolution of renewable energy tenders demonstrates that market stakeholders are actively working to overcome these shortcomings. Tendering authorities are now paying closer attention to offtaker demands when designing renewable energy tenders and are developing innovative solutions, such as demand-following FDRE. These solutions position India as one of the most advanced countries in the utility-scale renewable energy tendering market.

The renewable energy market has matured considerably, and all stakeholders, from investors to energy offtakers, have built a strong understanding of the intricacies of renewable energy technologies. Thereby, the centralised tendering model, which worked efficiently in the past by imparting enhanced payment security and boosting investor confidence, may face decentralisation to cater to each state's unique requirements. As indicated by SECI's significant PSA backlog, there is likely to be a gradual yet evident shift in market share of renewable energy tendering away from SECI towards bids invited by energy offtakers themselves. Developers point out that enhanced offtaker visibility in such tenders facilitates faster power agreement signings due to the lack of any intermediary agency.

Market stakeholders cite the lack of a resilient power evacuation infrastructure as the most significant risk factor for India's renewable energy market development. Sluggish growth of power evacuation infrastructure is waning developer interest in participating in new auctions. Additionally, the DISCOMs' are reluctant to enter into long-term PSAs until they have concrete visibility on the power evacuation readiness, which decides the project's commercial operation date (COD). The commissioning date of a project will ultimately determine the applicable bracket of ISTS charges as indicated by the Ministry of Power in its ISTS waiver expiration trajectory.

The gap between the tendering, allotment and project realisation will likely widen until the market streamlines and transmission infrastructure develops. Blending the tariffs monthly or quarterly may

partly address the PSA signing challenges, but the MNRE is still preparing its wide-scale implementation.[11]

For viable renewable energy tendering market growth, the central government must give equal impetus to all facets of the tendering process, from RfS issuance, allotment and power agreement signings. In addition to issuance, the government must specify annual targets for allotment and power agreement executions. That will ensure the REIAs issue bids only after planning for requisite offtake agreements. In addition, stricter enforcement of renewable purchase obligations and associated penalties is imperative to sustain renewable energy demand.

[11] Ministry of Power. Approval of Procedure for Implementation of Uniform Renewable Energy Tariff. October 2023.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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