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Kickstarting India’s offshore wind market: Lessons from India’s early tenders

Despite a decade of policy groundwork, India’s offshore wind ambitions have yet to take off. Ember’s brief analyses the shortcomings of the country’s early offshore wind auctions and proposes practical steps to unlock this critical clean power frontier.

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About Ember

Ember is an independent, not-for-profit energy think tank that aims to shift the world to clean electricity using data. It gathers, curates and analyses data on the global power sector and its impact on the climate, using cutting edge technologies and making data and research as open as possible. It uses data-driven insights to shift the conversation towards high impact policies and empower other advocates to do the same. Founded in 2008 as Sandbag, it formerly focused on analysing, monitoring and reforming the EU carbon market, before rebranding as Ember in 2020. Its team of electricity analysts and other support staff are based around the world in the EU, UK, Turkey, India, China and Indonesia.

Background

India's 53 gigawatts (GW) wind fleet accounts for one-fifth of the country's renewable capacity. It plays a crucial role by decarbonising the power sector while complementing solar, often generating more electricity in the evenings after the sun sets. The government's push toward offshore wind aims to harness higher, steadier winds and address the scarcity of high-quality onshore sites by leveraging India's 7,500 km coastline. Yet, despite a national policy since 2015, a decade of support from expert organisations and generous subsidies, India has not been able to harness its offshore wind power potential.

While the government has sought to lay the foundations for offshore wind by identifying potential coastal zones, publishing extensive metocean data and launching auctions for both projects and transmission infrastructure, market interest remains muted. Initial projects were to benefit from viability gap funding (VGF), pre-defined offtake contracts and exclusive rights to seabed plots. Yet the response was tepid at best — two landmark auctions found little interest from developers and were eventually called off in 2025.

To truly kickstart offshore wind in India, the government's approach must evolve, building on early groundwork through a blend of domestic innovation and global best practices. The priorities are clear: craft targeted incentives for first-of-a-kind projects, catalyse domestic supply chains and translate them into bankable projects that can come to life.

Subsidies and auctions are not the silver bullet

It's easy to assume generous subsidies might unlock new markets. In reality, the challenge runs deeper. Offshore wind projects are capital-intensive and engineeringly daunting — spanning up to half a decade before earning a single rupee. They rely on a complex ecosystem of seasoned developers bringing lessons from mature markets, specialised engineering contractors, robust supply chains and banks willing to shoulder risk. So far, this has proved elusive in India, which is why even the best-intentioned policies and auctions have failed to translate into active projects.

Auctions, often praised for their transparency, are blunt tools for pioneering new markets. By design, competitive auctions tend to squeeze out any margin of comfort, pushing bids into a downward spiral. In such settings, even small deviations from underlying assumptions can make project delivery highly uncertain. Overly stringent subsidy terms or rigid pricing structures, as seen in India's first 500 MW offshore wind auction in Gujarat, can dampen developer participation. This risk becomes particularly acute when external factors beyond industry control, such as tariff shifts and commodity price volatility, begin to sway initial assumptions.

The absence of local supply chains is a major deterrent for offshore wind in India. India's original equipment manufacturers (OEMs) have largely catered to onshore wind's requirements of wind turbine generators (WTG) in the 2-3 megawatt (MW) range. Globally, offshore wind now boasts of 10+ MW turbines on average. Building a supply chain crafted for offshore wind would require massive upgrades: dedicated production lines for high-rated WTGs, components engineered for corrosion and fatigue resistance and specialised logistics infrastructure including upgraded ports and heavy-lift equipment. An offshore wind supply chain cannot simply be imported: it must be cultivated locally.

Transmission infrastructure presents a parallel challenge. It is a chicken-and-egg dilemma: there is always the risk of one element being completed early and left waiting for the other. Encouragingly, the government has already initiated grid planning for prospective zones through India's central transmission utility (CTU), Power Grid, a welcome step. However, with brewing bottlenecks in the availability of HVDC equipment and transformers globally, adhering to timelines will be critical.

Once these elements are in place, risk-but-patient capital, which has so far been absent, will flow to the offshore wind sector. Sources of debt, such as development finance, and equity investors, who provide not just risk capital but also their experience in structuring complex offshore wind projects, will invest after the aforementioned preconditions are in place. Financing is unlikely to be the binding constraint, given that banks and investors are generally willing to lend to higher-risk but bankable projects when the fundamentals are strong, particularly given the greenium attached.

Learning from international experiences is essential

The 500 MW offshore wind tender in Gujarat demonstrates how failing to learn from international experience adequately can turn even a well-intentioned pilot into a struggle. The auction, by design, failed to address risks that such first-of-its-kind projects face, leading to its eventual scrapping.

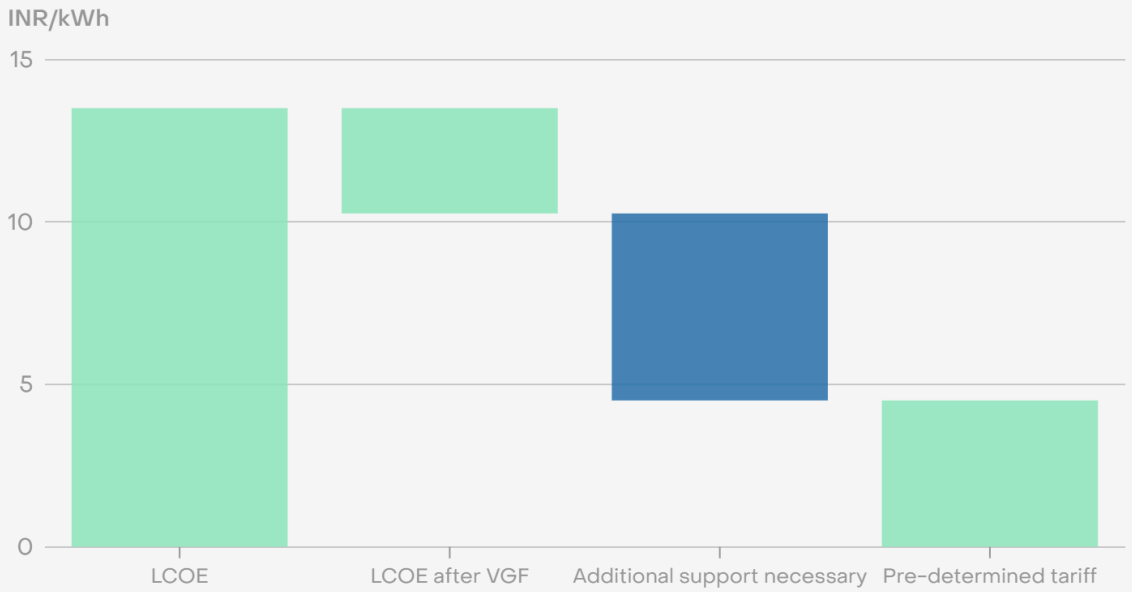
The project was to become India's first utility-scale offshore farm, resonating with the World Bank's advice to skip boutique demonstrations. It included the terms of a standard power purchase agreement (PPA), though with a fixed tariff (INR 4.50/kilowatt-hour (kWh)) and a capped subsidy (INR 8.128 crore per MW). Developers were responsible for turbines, foundations and array cabling to the offshore pooling substation, while state-owned Power Grid Corporation of India

handled export transmission, similar in principle to the German and Dutch practice of assigning offshore grid linkage to the Transmission System Operators (TSO). The government had also set earmarked funds for additional support, such as port upgrades.

However, the fixed tariff and a capped subsidy left little room for developers to balance revenue with initial cost assumptions. This approach contradicts the World Bank's guidance, which cautions against rigid conditions for auctions of demonstration projects.

India's tendering model even produced an uncovered gap: even after VGF subsidy, the levelised cost of generating electricity was about INR 5/kWh higher than the pre-determined tariff at INR 4.5/kWh. The tendered sites' lower capacity utilisation factor (CUF), estimated at ~36%, well below international benchmarks (~40-50%), compounded the challenge. Tendering the Tamil Nadu site, with its much higher CUF potential (~60%), might have offered stronger project economics. However, metocean data for Tamil Nadu remains preliminary, unlike the more extensively studied Gujarat site.

Even with viability gap funding (VGF), additional support would be needed to match the INR 4.5/kWh tariff



Source: The Centre of Excellence for Offshore Wind and Renewable Energy, SECI offshore wind tender · Calculated as per the FIMOI LCOE and VGF tool using a CAPEX of INR 251 million/MW and VGF of INR 81 million/MW for the Gujarat site. Other assumptions, including OPEX and CUF, are taken directly from the FIMOI LCOE tool.

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Transmission risk was also only partially addressed: while the tender allowed developers deadline extensions if the CTU delayed grid readiness, it offered no compensation for lost revenue opportunities. By contrast, European TSOs such as TenneT not only built offshore export grids, but also compensated developers when grid connections lagged behind schedule.

Contrast this with global best practice. In their early rounds, the UK and Germany ensured investor returns by offering more flexible tariffs and government underwriting of cable connections. The Netherlands and Germany delivered "ready-to-build" tender packages — full permits, geotechnical reports and grid

connections in hand – slashing early-stage risk. China relied on state-led buildouts and rapid localisation policies, swiftly nurturing domestic champions.

India's climate ambitions demand that it walks the talk on offshore wind. The lessons are clear. It must de-risk initial projects with more favourable tender designs while rapidly developing transmission infrastructure and ramping up supply chains for the offshore foray. Otherwise, the promise of 7,500 km of wind-swept coast risks remaining the elusive frontier in India's clean energy journey.