



GOVERNMENT OF INDIA
MINISTRY OF NEW
AND RENEWABLE ENERGY

Clean Energy Finance and Investment Roadmap

Workshop 1: offshore wind – Friday 4 March 2022

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Unlocking capital for offshore wind: workshop summary notes

India has made impressive progress on clean energy developments over the last decade. The government's most recent commitment to achieving 500 gigawatts (GW) of non-fossil fuel electricity generation capacity is very ambitious, but this goal reflects the scale of opportunities to achieve India's energy transition whilst delivering on other sustainable development goals.

Meeting India's clean energy targets to 2030 and beyond will require out-of-the-box thinking with collaboration across stakeholders, from developers, financiers and investors to state and central governments as well as with international partners. There are a number of challenges and barriers to address, including de-risking investments to unlock the capital needed for solutions like offshore wind. Yet, working together can bring forward solutions to address bottlenecks and to enable the finance needed to accelerate the deployment of renewable energy additions.

The time has come for offshore wind. The Ministry of New and Renewable Energy (MNRE) sees offshore wind as an important element in reaching the country's renewable energy targets to 2030 and beyond. India has a considerable coastline (7 600 kilometres with an exclusive economic zone of over 2.3 million square kilometres) and high energy demand growth. Offshore wind can provide more consistent (i.e. less variable) energy supply, complementing on-shore renewables and addressing issues like limited land availability. Estimates in Gujarat and Tamil Nadu alone already highlight more than 65 GW of potential offshore wind power in feasible zones.

Developers and investors alike are keen to enter India's offshore market, but enabling momentum for project development and investments requires efforts to ensure that inspiration has the right conditions and clarity to become reality. The government notified its National Offshore Wind Energy Policy in 2015, and further measures such as the National Institute of Wind Energy (NIWE) guidelines for offshore wind power assessment studies and surveys have been informed to facilitate project scoping.

MNRE presented its plans to achieve 30 GW of offshore wind by 2030. 8 preliminary zones have been identified off Gujarat, with a further 8 zones identified off Tamil Nadu. 5 and 7 zones each, respectively, are expected to be available for exploitation in coming years, and NIWE has carried out detailed wind and marine studies for one zone already in Gujarat, as well as a rapid environmental impact assessment for that zone. Detailed studies and assessments are still needed in Tamil Nadu. Offshore potential in other areas (e.g. in Tamil Nadu and/or other states) is also uncharted, and the government is open to exploration by private investors to carry out required studies and surveys.

MNRE proposes an offshore roadmap with a first tender of 1 GW of offshore wind capacity additions in Gujarat in 2022. A second tender of 2 GW in 2023 would seek to develop capacity within a zone identified and assessed by developments. Considering the high wind resources off the coast of Tamil Nadu, where NIWE is installing floating LIDAR to validate wind measurements, projects under the second tender are highly likely to be developed in Tamil Nadu. Private investors will also be invited to



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carry out studies, survey and assessment work within the exclusive economic zone for offshore wind project development.

To facilitate the proposed 2022 and 2023 developments, the first two rounds of tenders would certainly require financial support. Accordingly, a suitable finance support proposal in the form of viability gap funding is under preparation for the Ministry of Finance. The tenders are proposed to be floated by the Solar Energy Corporation of India (SECI), and grid connectivity would be carried out through Powergrid and the Central Transmission Utility (CTU). The offshore transmission and evacuation infrastructure through CTU is proposed to be socialised. Future project support (beyond 2023) is proposed to be made available through transmission infrastructure (up to the developer offshore substation) and through fiscal incentives (e.g. waiver of transmission charges and potential multipliers for renewable energy certificates). MNRE is also formulating offshore seabed lease rules (30 years) that will be notified shortly.

Group Discussion: solutions to enable market development

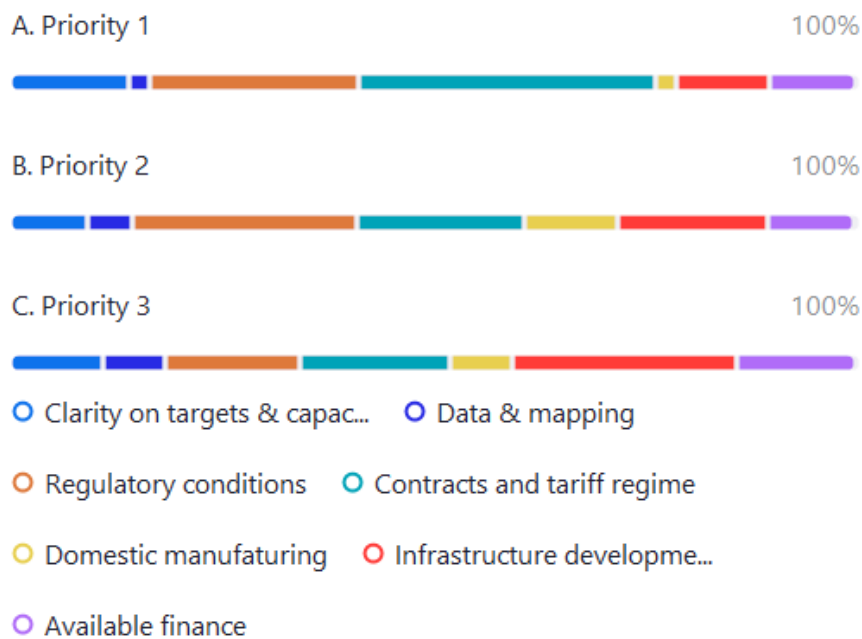
It is clear that initial capital needs for offshore wind will be high, and a number of additional elements will need to be addressed to lower the long-term cost of offshore wind: for instance, supply chain, transport and logistic infrastructure as well as domestic capacity building. Early stakeholder consultations by the OECD and NRDC in preparation of this first CEFI Roadmap workshop on offshore wind heard a number of key issues, including:

- Challenges and barriers to early market development such as:
 - Need for clarity on policy (e.g. on tendering and seabed rights) with a roadmap to scale, a clear regulatory framework and the expected incentives/support (e.g. on points like tax, local content requirements and import duties);
 - Data and mapping, including whether this will be the responsibility of developers, and availability of information to participants;
 - Revenue stability, addressing concerns on tariffs, sanctity of power purchase agreements (PPAs) and eventual risk mitigants (e.g. generation-based incentives or viability gap funding). Addressing issues like distribution company (DISCOM) payments and the role of tools such as payment security mechanism or renewable purchase obligations;
 - Co-ordination between actors, not only government agencies but equally where support such as development assistance is injected to avoid distortions in the market.
- Needs to scale up additions (including whilst the first projects are being finalised) with:
 - Infrastructure development such as ports, yards and transmission capacity, ensuring there are no critical delays that hinder growth, and considering how this can be co-ordinated through existing mechanisms/funds such as the National Monetisation Pipeline, the 'gati shakti' scheme, sovereign green bonds and the Green Growth Equity Fund;
 - Developing a domestic supply chain with required industry expansion/investment and skill development/capacity building as well as a clear pipeline to volume (e.g. 100+ turbines per year) and clarity on support (e.g. under production-linked incentives [PLI]);
 - Overall cost and capital needs, including issues with access to finance and cost of debt, especially for smaller players in local supply chains, where ad-hoc financing will not suffice to solve this problem;

- New financing solutions and investment vehicles, including possible support such as credit enhancement mechanisms, to achieve capital scales commensurate with offshore targets (e.g. at USD 2-3 billion per GW)

Group poll results during the workshop highlighted a number of these points as priorities for short-term and longer-term offshore wind market development. The top three priorities for short-term development highlighted by the group poll (both by individual order of priority and collective ranking across the three priorities) were: 1) clarity on contracts (e.g. PPA conditions/sanctity), tariff regime and revenue support; 2) regulatory conditions (e.g. technical standards, import duties, local content requirement and GST, etc.); and 3) need for infrastructure development (e.g. ports, yards and transmission).

Poll 1: What are the top 3 issues you see as critical priorities for 1st GW?



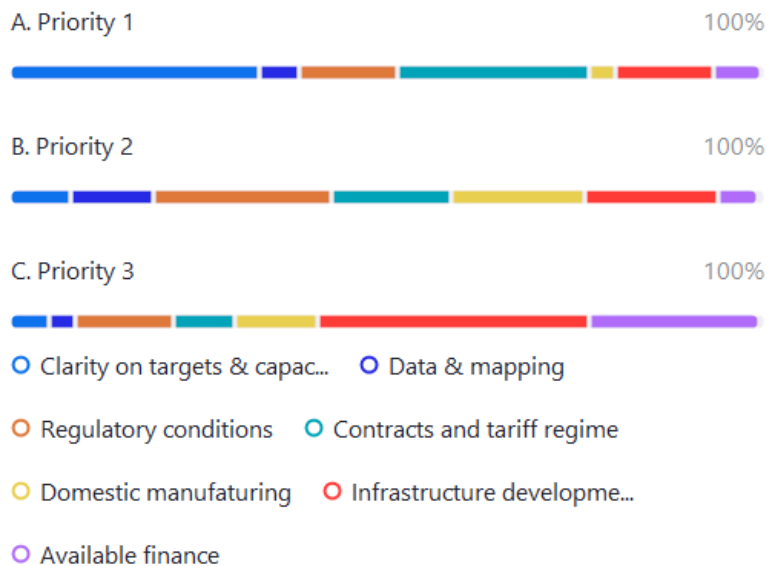
Participants also indicated (beyond the above-listed seven categories) other barriers/challenges for early market deployment, including: available skill and market capacity to deploy solutions; material cost and availability; the speed and capacity of stakeholders to meet/handle the proposed timeline and scale of additions; and potential environmental and/or social conflicts. Respondents also reaffirmed multiple elements needed within the overall policy framework, including: clarity on contracts and tariffs; clarity on site selections; visibility on annual tendering to avoid “boom and bust” cycles; clarity on seabed rights and lease awarding criteria (where a letter of consent is not the same thing as an option agreement); and well defined/co-ordinated regulatory approval processes.

Further data and mapping resources were also noted, not only for future sites but also to reflect trends in plant load factor (PLF) over time, which is challenging with only one or two years of data. This information may also need to be integrated into support mechanisms (e.g. viability gap funding) if average wind speeds are in a decreasing trend.

Written responses to the poll equally included proposals for: a separate set of renewable purchase obligations (from onshore capacity additions) to support PPAs and power sale agreements (PSAs); PPA support by the government; a long-term roadmap and cost reduction strategy; support for future technologies such as next-generation turbines; and building a pipeline in excess of 30 GW to allow for planning on issues such as project attrition.

The top three priorities for scaling up development to 2030, as highlighted by the group poll (by individual order of priority) were: 1) clarity on targets & capacity pipeline (including where and when); 2) regulatory conditions (e.g. technical standards, import duties, local content requirement and GST, etc.); and 3) need for infrastructure development (e.g. ports, yards and transmission). When taken collectively across the three priority areas (as cumulative voting), the top three order changes slightly to: 1) need for infrastructure development, followed by ties for 2 & 3) regulatory conditions & clarity on contracts and tariff regime.

Poll 2: What are the top 3 issues you see as critical priorities to scale up to 30 GW?



Participants also indicated (beyond the above-listed categories) other barriers/challenges for scaling market development to 2030, including: available skill and capacity to deploy solutions; potential risks related to ecological impacts and social acceptance (e.g. requiring awareness raising and talking to local communities); and need for international co-operation (e.g. on learning from what has worked) and related financing (e.g. through multi-lateral development banks, and to address issues like currency exchange rates/indexing).

Respondents also reaffirmed needs for elements within the overall policy framework, including: clarity on tariffs and offtaker agreements; clarity on seabed lease awarding criteria (including possible options to rights for exploration for developers to invest in studies); well defined/co-ordinated regulatory approval processes (e.g. through prequalification criteria and/or using a single-window or “one-stop shop” approval); and visibility on market volumes and pipelines beyond 2030 targets. This pipeline could include renewable (offshore) purchase obligations similar to what is used for hydropower, boosting development through demand by DISCOMs. Having volume in seabed leasing could also signal scale to encourage development of local and domestic supply chains.



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At the same time, it is critical to create momentum in the market, even as policy framework is being finalised/refined, to enable long-term capacity additions. Learning from other markets, with as much as 30 years of development in offshore wind additions, highlight the importance of getting the first projects going. This needs to be complimented with consultation with developers and a clear picture of the pipeline of projects to come, making it easier for developers/investors to tackle issues like risks and supply chain costs.

Lastly, the need for infrastructure (e.g. transmission and ports capable of supporting 15-20 megawatt turbines) and support of synergies/integration within India's energy industry were highlighted for long-term capacity additions. Additional project/investment risk mitigation (e.g. through viability gap funding) and financial support (e.g. PLI for components manufacturing) were likewise noted for enabling capacity development to 2030.

Group discussion: actions to unlock finance and investment for 2030 ambitions

Remarks by participants highlighted several important elements for achieving 2030 ambitions, such as the critical role of enabling sufficient volume in the market to reduce costs and signal opportunities for investors, whilst ensuring parallel development of support infrastructure such as ports and transmission as well as overall supply chains and domestic manufacturing capacity.

This will require significant financing and investment. First projects may be able to kick off without everything in place, but unlocking a robust pipeline to 2030 and beyond will require instruments to de-risk investments, with clarity and visibility on points like the legal framework and who will bear risks before financial institutions and investors will sign on to projects. For instance, it will be important to clarify long-term cost reduction strategies if proposed viability gap financing is to be phased out after the first few projects.

The government may also want to put forward the expected/required size of the viability gap funding, where partners and international support can help to close the gap, amongst other eventual needs to support scaling up of capital for offshore wind to 2030. This includes for other potential risks (e.g. curtailment and concerns about revenue stability) and the necessary foresight for the long-term viability of industry investments that will support future cost reductions.

Stakeholders are keen to support India's offshore ambitions, and partnerships can bring together the required expertise and financing to achieve those ambitions. Expertise on a global scale in financing offshore wind pipelines can help, for instance in structuring PPAs to enable scale. Experience in India with on-shore solar and wind developments (e.g. the Madhya Pradesh solar park) are also of value and highlight the importance of stakeholder engagement (e.g. with development financial institutions) in addressing risks and developing solutions that ensure projects are bankable.

A centralised approval process will also help to mitigate project risks for developers and investors, leaving their risks as much as possible to the boundaries of actual construction. Price targets also should not be so focused on meeting/beating solar prices, but rather on creating a framework that brings in the system services and benefits (e.g. balancing and grid operability) of offshore wind. This can help to develop complements across solutions, whether solar or storage, and increase commitment to offshore wind investments.

Overall, it is important that deployment targets be underpinned by credible measures that galvanise opportunities for finance and investment in offshore wind development. While initial costs may be



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high, India has the benefit of building upon experiences in other markets to come in at lower costs and enable cost declines through a clear roadmap that addresses obstacles and risks for capacity additions.