INSTITUTIONAL PARTNERSHIP

- Offshore Renewable Energy Catapult and NIWE's Joint Declaration of Intent (JDI): To establish a 5-year collaboration programme to support the UK and India's offshore wind industry mainly working on innovation and R&D, market and supply chain growth, new technology test and demonstration, as well as skills programmes, blade test facility, turbine and grid simulations.

- Catapult's India offshore wind supply chain exercise funded by UK Research and innovation, launched during the first UK-India offshore wind summit, is to be released during the second UK-India offshore wind summit.

- Accelerating Smart Power and Renewable Energy in India (ASPIRE) programme is a bilateral programme, being implemented by the Foreign, Commonwealth and Development Office (FCDO), Government of UK in partnership with the Indian the Ministry of Power (MoP) and the Ministry of New and Renewable Energy (MNRE). OSW is one of the seven thematic priorities of this partnership.

- To explore and jointly develop offshore wind, MoUs were signed between Oil and gas company ONGC and the National Thermal Power Corporation, the largest power generator utility; and Germany-based RWE Renewables and utility Tata Power Renewable Energy[8].

- The World Bank and Asian Development Bank and the European Investment Bank are expected to support India's strides for harnessing OSW.

- The Department for Business and Trade India, a UK Government department operating in India to facilitate business, trade, and investment partnerships between the UK and India signed a strategic partnership with the Global Wind Energy Council (GWEC) India on the 10th of March 2023 to jointly work towards supporting India's offshore wind ambitions through targeted interventions including exchange of knowledge.

[8] GWEC Global Offshore Wind Report 2022

CURRENT STATUS

In November 2022, the MNRE notified a draft seabed lease tender to tap 4 GW OSW capacity off the coast of Tamil Nadu. The draft tender targets model 3 of the Strategy Paper published earlier and is designed for open-access OSW projects. The India Offshore Wind Working Group, convened by GWEC India, has submitted industry representations and feedback to the MNRE on the draft seabed lease tender, strategy paper, and discussion paper. As per the 37 GW seabed lease tender trajectory earlier notified by the central government, India is likely to notify its first tender within the financial year 2022-2023.

The status of offshore wind site readiness[9] presented in the table below shows that Tamil Nadu sites have stronger offshore wind resources than Gujarat sites.

Category	Gujarat	Tamil Nadu
LiDAR	One LiDAR commissioned at Zone-B in November 2017	No LiDAR installed; NIWE floated e-tender to install 3 LiDARs in zones B1, C1 & E2
Avg. Wind Speed	~7.51 m/s @100m HH as per 2-year LiDAR data analysis by NIWE in Zone-B	NIWE's 100 m guyed mast installed at Rameshwaram shows 8.62 m/s average wind speed @100m HH and WPD of 603 W/m² @50 m a.g.l.
Soil Condition	Extensive weak clay or soft soil layers (~9m) found in Zone A & B; challenging and costly for foundation design and need customization	Better than Gujarat site- soil profiles for zone A indicate significant spatial variation in the southern Tamil Nadu offshore region; ranging from weak/ loose sands/clays to strongly cemented sand up to a depth
Infrastructure and Logistics	Pipavav port is larger and more lively with high vessel availability and storage facility in the region but needs to be optimized for offshore wind	Ports are relatively smaller in size; need significant modification efforts for readiness for OWF installation
Coastal Area	Rich in biodiversity and has fishing communities up to 10 km off the coast; Rapid Environmental Impact Assessment (EIA) study is done, however, a detailed EIA study for overall impact analysis is required	Strong tradition of fishing communities in the coastal area; precise geopolitical, EIA, and social acceptance study is required; Fisherman community protest on the offshore wind was noted in August 2022
Tender activity	EoI invited, in 2018, for Zone-B nearest to Pipavav port in the Gulf of Khambhat- Rapid EIA study, Geotechnical and geophysical analysis was done. First auction under Model 1 could be expected in 2023-24 as per the Indicative auction trajectory for offshore wind given under the MNRE strategy paper.	Draft offshore wind seabed lease tender for allocating 4 GW offshore wind equivalent area (B1, B2, B3, B4, G1) floated in November 2022; final tender is awaited in 2023. In the final tender, capping on the leasing fee, timeline provision for key activities/clearances/issuance of certificate(s), EIA guidelines and de-risk mechanism for possible delays should be specified. In addition to these, GWEC India Offshore Wind Working Group made detailed feedback representations to MNRE urging for a stakeholder consultation with MNRE before the final tender to make it highly effective.
Test Centre Site	-	75 acres of land is allocated to NIWE for setting up the first National Offshore Research & Testing Facility 2019-29

[9] Based on FOWIND studies

SEIZING THE OFFSHORE WIND OPPORTUNITY

Currently, India is an offshore wind market "under creation". The central and state governments are working with a range of offshore wind (OSW) stakeholders for creating an ecosystem for a thriving and world-class offshore wind industry. Tapping the OSW potential and underlying socio-economic, environmental and climate benefits requires a multi-pronged approach:

Attractiveness

As much as is important the "Ease of Doing Business", it is also important to have the right set of business volumes along with time-bound targets. This must be complemented with facilitative policies, regulatory frameworks, permits, and clearances as well as needful infrastructure (such as ports and logistics). Further, needful regulatory frameworks must be introduced to facilitate the inclusion and absorption of OSW in the power system as well as ensure its co-existence in the larger socio-environmental architecture that is relevant to OSW projects. Additionally, the development of support systems for large/smaller vessels for the loading/unloading of heavy and big-size equipment/machinery as well as for ferrying resource persons is pivotal. In a very short span of time, India has made commendable progress toward analyzing, estimating and planning for infrastructure to support the offshore wind industry. The central government has taken cognizance of current gaps and is proactively working towards ecosystem development for OSW.

Co-operation

Synergistic partnership between the offshore wind rich states and the center is inevitable for the successful creation of an OSW ecosystem. By extending support through policy interventions, needful financial and non-financial incentives, and requisite standards and guidelines, the center must lay out the foundation. At the same time, states must develop a roadmap to support the graduation of the existing onshore wind industry to OSW, as well as to identify capacity development and community engagement plans for widespread acceptance of the benefits of harnessing OSW. Further, innovative public-private partnership channels, comprising an OSW developer, Central Transmission Utility, and a third-party power infrastructure developer, may be explored for the development of OSW power evacuation and transmission infrastructure where they all have a shared accountability for timely commissioning of requisite infrastructure.

Competitiveness

The Levelized cost of electricity (LCOE) of OSW power is expected to be relatively higher than the then prevailing LCOE of electricity generated from other renewable energy technologies such as onshore wind and solar energy. If the state governments partner with the center for the procurement of OSW power, the onshore ISTS network shall be set-free and any financial relief that has been proposed for use of ISTS infrastructure may be leveraged to bring down the LCOE. The United Kingdom (UK) leveraged "Contracts for Difference CfDs" to promote the growth of utility-scale renewable energy projects such as offshore wind (Box 1).

BOX 1: LEVERAGING CFDs TO PROMOTE OFFSHORE WIND

The UK awarded the first round of funding for Contract for Difference (CfD) in the year 2014 to five offshore wind projects. CfDs is a contract between a green power generator and the Low Carbon Contracts Company (LCCC), which is a company owned by the Government. The LCCC is responsible for distributing the CfD contracts. As part of this contract, the successful bidding agencies and the LCCC enter into a contract. Under the contract, the bid winners are paid a flat rate for the contracted period of 15 years. In case the reference price, which is the average market price for electricity, is below the strike price, the LCCC is mandated to pay the power generator. This enormously mitigates business risk. At the same time, if the reference price is above the strike price, the generator is mandated to pay the difference to the LCCC. This eliminates the need to pay any subsidy for green electricity generation when the price of electricity is higher than the strike price.

The MNRE is pursuing support through viability gap funding for OSW projects under Model 2 specified in MNRE's Strategy Paper. It is certain that business shall evolve to fill gaps given a lucrative opportunity emerges. While the supply chain for OSW shall have to be developed in the due course, the initial few GWs are likely to be largely reliant on imports for components such as turbine, generator, and gearbox among others. Similarly, domestic capacities for services such as engineering, project management, operation & maintenance and insurance shall have to be nurtured for the long term. Waiver of taxes, import duties (including for the floating LiDAR buoy) and GST is recommended until the local supply chain is set up. Also, a ten-year tax holiday (80IA) and accelerated depreciation for offshore wind could be instrumental in determining the overall economics of offshore wind projects.

Utility

A range of procurers of OSW and its utility shall have to be identified and relevant business models shall have to be designed. While the business shall do the heavy weight lifting here, to support offtake, the central and state governments may introduce targets for blending OSW with power generated from other sources. At the same time, business models designed to appreciate the specific value, such as round-the-clock (RTC) power generation potential, can likely drive the commercial success of OSW in India. In a recent move, the states of Gujarat and Tamil Nadu have agreed to procure OSW power at a tariff of INR 4/unit. OSW tenders must be supported with facilitation for offtake and in absence of such support, development finance institutions must prioritize institutionalizing a business risk mitigation fund to support the development of the market.

Resilient Supply Chain

As per GWEC's Global Offshore Wind Report 2022, in the year 2021, 84% of the new OSW installations happened in the APAC region—Other than China, Taiwan and Vietnam have emerged as markets of interest for OSW projects developers, manufacturers and other service providers. While the OSW project involves the engagement of a range of stakeholders from tendering to commissioning, there are only a limited set of stakeholders who have expertise in OSW projects. Further, the Indian OSW market, as it evolves, shall require customized turbines to be able to optimally harness available wind resources and meet the projected capacity utilization factor in local site conditions. Hence, to transition from a "market under creation" to an emerging market, India needs to ensure a resilient supply for its OSW ambitions. Steel, which constitutes almost 80-90% of offshore wind farm equipment, and other components such as rare earth metals are susceptible to price shocks arising from force majeure events leading to the unviability of originally agreed upon tariffs in the future. Hence, the GoI must introduce robust indexation mechanisms to accommodate tariff adjustments in such cases. Next, India must also leverage its leadership in shipping to support OSW vessel requirements at various stages of project development, commissioning, and post-commissioning. Finally, just like enterprises operating in Special Economic Zones, enterprises operating in designated OSW manufacturing and project zones must also be provided with attractive financial and non-financial support systems to ensure a thriving ecosystem that supports decarbonization as well as improves India's leadership in the global OSW supply chain.