



Session at 3rd Global RE-Invest

EU-India Cooperation of Renewable Energy with a focus on Off-shore Wind

27th November 2020

Session Proceedings

Session on EU-India Cooperation of Renewable Energy with a focus on Off-shore Wind

On 27th November 2020, the Delegation of the European Union to India, hosted a session at the 3rd Global Renewable Energy Investment Meeting and Expo (RE-Invest 2020) titled 'EU-India Cooperation of Renewable Energy with a focus on Off-shore Wind'. In this session, the new EU Strategy on Off-shore Renewable Energy ([Link](#)) was presented, and the future of an Indian Off-shore wind industry was discussed, focusing on the required supply chain. The session aimed at identifying the current gaps in a potential off-shore supply chain in India and assessing how Indian and European businesses can best tap into this promising renewable energy market.

The session was supported by the EU-India Clean Energy and Climate Partnership (CECP) project (www.cecp-eu.in and [@EU_India_CECP](#)) and was attended by various participants, representing policymakers, regulators, project developers, manufacturers, port operators, system integrators, EPCs, think tanks, consultants and academia.

Both the EU and India have set ambitious targets for renewable energy and are keen on further strengthening their cooperation in this area under the EU-India Clean Energy and Climate Partnership. In addition to cooperation on solar energy and integration of renewable energy in the grid, the EU and India are working together in the area of off-shore wind, including through the former extensive [FOWIND](#) and [FOWPI](#) projects.

1.1. Inaugural and Keynote Sessions

Introduction and welcome of participants

H.E. Ugo Astuto, Ambassador of the European Union to India extended a warm welcome to all the participants. The ambassador started off by highlighted the shared ambitions of the EU and India in increasing the share of renewables in the energy mix. He spoke about how the European Green Deal together with the digital transformation agenda provide a development growth model for a more sustainable, inclusive and resilient economy. The Green deal provides an action plan to boost the efficient use of resources and transition to a clean, circular and energy efficient economy while restoring biodiversity and reducing emissions. The objective is to become a climate neutral continent by 2050.

This Green Deal requires action from all sectors to invest into environmentally friendly technologies, support industry to innovate, build cleaner transportation systems and buildings, and also decarbonize the energy sector. The recent EU strategy for off-shore renewable energy which includes wind, tidal and wave energy is an important part of achieving the objectives of the Green Deal.

Cooperation between in the EU and India in the area of climate action and energy takes place under the 2016 Clean Energy and Climate Partnership. At the EU-India Summit in July it was agreed to further strengthen the EU India Clean Energy and Climate partnership, including in the area of renewable energy. The off-shore wind energy sector can play a vital role in the transition to clean energy.

The EU has been cooperating in the area of offshore wind with the Ministry of New and Renewable Energy (MNRE), National Institute of Wind Energy (NIWE), and other stakeholders, through extensive studies, workshops and study tours. This session is another good example of the close collaboration between India and the EU in enabling an off-shore wind energy sector.

Key-Note Address

Sh. Bhanu Pratap Yadav, Joint Secretary, Ministry of New and Renewable Energy (MNRE)

The Joint Secretary, in his keynote address highlighted the size of the Indian economy and market, alongside an established electricity regulatory system and robust manufacturing for on-shore wind. Given the

nascency of India's off-shore wind industry, the ministry is developing a strategy for developing the industry in India. Lessons from developed off-shore markets like the EU have proven to be valuable for understanding the scope and requirements for project development particularly in the area of financing, PPA structure, technology and skill development in this sector.

The assistance from the European Union, specifically on identifying the economic and technical gaps, site selection strategy, technology assessment, etc. has been instrumental in initiating India's off-shore wind industry. Sh. Yadav also acknowledged the contribution from Govt. of Denmark for deputing an off-shore wind expert to the MNRE.

Regulatory mechanisms are being developed to ensure that developers of these technologies find value in deploying these assets. Given the falling tariffs for solar and on-shore wind, the option of bundling of power from these sources with off-shore wind was discussed, however the option was ruled out as the current regulatory regime does not allow for bundling of power from different sources at varying tariffs. The off-shore wind sector would be provided with Viability Gap Funding (VGF) to ensure a lower landed tariff (Rs./KWh) and thereby improved viability for the initial set of projects.

Gujarat and Tamil Nadu are the first states that have been selected for initial phase of off-shore wind development. NIWE has already carried out Bathymetry and Geotechnical/Geophysical assessment for sites in Gujarat and wind data from Tamil Nadu is also available for the last 5 years. MNRE is collecting further data and studying implementation processes for streamlining project development activities for 10 GW off-shore wind projects to be set up in India.

Keynote address - The new EU Off-shore Renewable Energy Strategy and EU-India cooperation on off-shore wind

Mr. Hans van Steen, Acting Director, Renewables, Research Energy Strategy, Innovation and Energy Efficiency, Directorate-General Energy, EU Commission,

India and the EU have been cooperating in the area of renewable energy, energy storage, energy efficiency, off-shore wind and electricity market design since the inception of the CECP in 2016. The importance of the CECP partnership was also recognized at the recent EU India summit. India's policies on providing electricity access to the entire country and its ambitious targets for renewable energy are impressive.

A key element to the EU's Green Deal targets to become carbon neutral by 2050 is the development of the off-shore energy sector including wind, tidal and wave energy. The EU is targeting to install around 60 GW off-shore wind energy by 2030, and also develop other types of ocean renewables. The EU is aiming to target 300 GW of off-shore wind and 40 GW of ocean renewables by 2050. These targets will require cooperation at all government levels and also a special emphasis on research and development.

Off-shore wind has a number of advantages compared to other traditional power generation technologies including smoother power generation, marginal requirement for land resources, acceptance from nearby communities, etc. In the EU there is a lot of expertise in technology and policy development for such renewable energy projects and the EU is keen on sharing this expertise, including as regards how to reduce costs and to increase scale for off-shore wind development in India. The cooperation on off-shore wind between the EU and India encompasses areas like skill development, technology and innovation.

Mr. Hans Van Steen mentioned the three key elements to the development of off-shore wind, which were;

- **Visibility:** Developers are keen to invest into the technology when there is a clean and clear pipeline for project development
- **Supply chain:** Optimization of manufacturing supply chain as well as development of infrastructure and port logistics
- **Structuring:** Driving cost reduction through innovative financing and contract structuring.

The FOWIND and FOWPI projects have been instrumental for assessing the feasibility of off-shore wind in India. The projects assessed also the required supply chain, wind and soil conditions on site that are suitable for off-shore wind deployment in India. Study tours have been organized for the Ministry and various stakeholders including NIWE to off-shore wind projects in the EU, including to showcase the port logistics and essential infrastructure required for off-shore wind project development.

The EU stands firm in its commitment to providing support to India in its endeavor to develop its off-shore wind energy. This includes continued cooperation in the areas of ports and logistics along with gap assessments of training and skills in this sector. The EU can also cooperate with India in with the area of grid integration of off-shore wind and auction design to bring down costs and increase scalability of the off-shore wind sector in India.

India's long coastline coupled with engineering skills and low labor costs place it at a very strategic position to capitalize on the strong home market for the development of off-shore wind. India also holds the potential to become the leading technology provider and the knowledge hub for off-shore wind in South East Asia region.

Presentation: Supply Chain Study for Off-shore Wind in India

Mr. Erik Mohr, Project Director, Wind Energy and Renewables, COWI

The study on "Supply Chain Study for Off-shore Wind in India" was initiated under the project "Business Support to the EU-India Policy Dialogues" ([Link](#)), with the aim to identify the challenges and opportunities of India's future off-shore wind industry, and the progress of supply chain developments that are needed in order to achieve the desired cost reduction and scalability in the off-shore wind industry.

Onshore wind in India is a mature industry with more than 35 GW of installed capacity; off-shore on the other hand is just starting to develop in the country. The ambitious goals of the target of 30 GW of off-shore capacity by 2030 would require vast technology and resource expertise as well as financial investments.

While there are similarities between the on-shore and off-shore wind industries including the wind turbine technology and supporting towers, power evacuation infra and certain O&M protocols, the off-shore wind sector requires much more specialized technical capabilities in terms of ports, costal manufacturing facilities, and ships/vessels.

The additional infra for off-shore wind includes ports and marine infrastructure including specialized ships and vessels for building and maintaining the projects. Custom built manufacturing required for the off-shore wind industry means that supply chain for component manufacturing and project development also needs to be developed domestically to maintain the cost competitiveness of energy generation. The supply chain for off-shore wind can be broken down into 5 key elements which can be analyzed to identify interventions required for developing the off-shore wind sector in India:

- **Wind Turbines:** The manufacturing facility for off-shore wind turbines needs to be located on the coast. Due to the large size of the turbine blades and nacelles, co-locating these manufacturing facilities on the coast facilitates easy and quick installation.
- **Off-shore foundations:** Direct applications/learnings from the oil and gas industry can be leveraged here and existing shipyard and steel manufacturing facilities can adapt their manufacturing for off-shore foundations. The market however needs to shift from low volume high margin to high volume low margin business model, for achieving the scale of deployment envisaged by the country. This can be achieved through a high degree of design standardization.
- **Electrical Infrastructure:** Required to transmit the power from the turbines to mainland, these systems can be manufactured by existing industries but would still require expertise as installations move to deeper waters.

- **Vessels and Ports:** Used for foundation laying, wind turbine construction, electrical cabling, and O&M activities. Initially, jack-up barges from the oil and gas industry can be used to kickstart installations. However, for meeting the precision standards required for larger turbines, purpose built vessels have become the industry standard in the off-shore wind sector.
- **Operations and Maintenance:** Specialized ports that can host the vessels, equipment and personnel (that can service the turbines) are required for the O&M of off-shore wind farms. Unlike construction ports that can be few in number, there is a requirement to have much higher number of O&M ports to achieve the scale of deployment that India is targeting. Currently, there are very few ports in India that are feasible for such operations.

The key elements that an Indian supply chain would require are the availability of the project pipeline, streamlines approval process, support mechanisms and enabling logistics and port infrastructure. A firm commitment to a pipeline of off-shore wind projects will reduce the risk perceived by investors for these large capital investments. This can be enabled by the Indian govt by setting up the regulatory framework and also through support mechanisms including Feed in Tariffs, Renewable Purchase Obligations (RPOs), interest rate rebates and variable tax rates. As for the marine vessels required for the construction and maintenance of the off-shore wind farms, India can leverage the expertise within developed off-shore wind markets like the EU to begin installations while starting to develop its own domestic capabilities. Off-shore wind requires larger man-power and creates more jobs than onshore wind, which presents an opportunity to India to train and develop the technical man-power required to construct and service the off-shore wind projects.

The off-shore wind industry in India may initially be supported by expertise globally, including from the EU, but as the pace of installations and investments improve, the country would start developing its own domestic capabilities to further drive the price reduction in this sector. The amount of localization and its corresponding benefits would be directly related to the pipeline of the projects. There is thus a huge opportunity to unlock the off-shore wind industry and create ample jobs through localization.

EU businesses on the other hand need to adapt and evolve in line with the business environment and regulatory frameworks in India. While this might be easier for businesses with global presence, it might be difficult for small and medium size businesses operating only in the EU. The companies interested in the Indian marketplace need to also understand the tax regime and the import export activity in India, while also getting a clarity on long term project development.

To summarize, the off-shore wind industry in India can be built using the global expertise that EU has amassed over the past 20 years, but with a local understanding of how the Indian business landscape functions. Thus, there is great potential for cooperation between India and the EU as regards the development of the off-shore wind industry.

1.2. Panel Discussion

Following the inaugural session, a panel discussion on the presented report and ways to accelerate deployment of off-shore wind was held, which was moderated by **Mr. Nicolas Couderc**, Chairman, WindEurope and Executive Vice-President, EDF Renewables.

In his introductory remarks, Mr. Nicolas requested the panel to highlight current Indian capabilities and gaps that India needs to fill, in order to support the off-shore wind Industry. The panel was also requested to indicate the opportunities and challenges for businesses in the EU and India keeping in mind the evolution of the off-shore wind industry and the supply chain required to support the sector.

Key messages from panelists

Dr. K. Balaraman, Director General, National Institute of Wind Energy (NIWE)

India's strategy for off-shore wind has a larger focus beyond the domestic market, as it is also aiming to capitalize on the future possible opportunities in the Asia Pacific region. India and EU businesses are already collaborating for on-shore wind and will continue to do so for the off-shore sector. The critical factors that India needs to assess is the supply chain management and development given that there have not been previous precedents of such projects in India. Another key area that India needs to strengthen is the development of off-shore wind technology for the low wind speeds specific to India, while keeping the costs low.

Dr. Jochen Dirksmeyer, Head Development, wpd off-shore solutions GmbH

The core benefit for off-shore wind in India is 1) a new renewable technology with a large potential and 2) creating employment for Indian citizens. Both these benefits are fully in line with the vision of the Government of India. To transform India into a manufacturing hub for off-shore wind energy, it is essential to create a robust and reliable project pipeline. The target of 30 GW of off-shore by 2030 needs to be supported by reliable mechanisms for Power purchase (agreements), regulatory frameworks and grid interconnection. The huge investments required for manufacturing and project deployments need would have to be assured that the risks have been mitigated through adequate government interventions. Demonstration projects are a good starting point for investors and project developers to kickstart the off-shore wind industry.

Mr. Ashwani Kumar, CEO, Suzlon

Off-shore wind is potentially an important segment for Suzlon. The power generation curves from off-shore projects match electricity consumption patterns in India, with the evening breeze coinciding with the evening peak power demand across the country. Off-shore wind offers complimentary generation to solar and both combined offer a more manageable generation profile reducing intermittency. The supply chain for the off-shore wind industry can be primarily split into two parts 1) the low speed wind turbines, in which India has some experience and expertise from the on-shore projects which can be adapted to supply turbines specific to off-shore installations and 2) port and vessel infrastructure supply chain, which is possibly the sector where India lacks the expertise and knowledge for development of off-shore wind. The volumes needed for setting up the second element to make it economically viable is the crucial aspect for scaling up off-shore wind energy in India.

Dr. Praveen Saxena, CEO, Skill Council for Green Jobs

Off-shore wind is a natural next step for any country that already has sizable deployments of onshore wind and India will therefore likely also take steps to develop the off-shore wind industry. Off-shore wind has the capability to develop future jobs for India and skill development in this area is a priority that may be undertaken in cooperation with NIWE and relevant stake holders. The Skill Council for Green jobs is working to develop a center of excellence/institute for skill development in off-shore wind in collaboration with industry and academia. Experts from EU can offer their knowledge and expertise that would be instrumental in developing the skills and resources for a thriving off-shore wind sector in India.

Mr. Vijaymurthy Tanikella, Advisor, Van Oord Off-shore Wind b.v. and Director, Van Oord India Pvt. Ltd.

Van Oord Offshore Wind b.v. has developed complete solutions for EPC/BoP contracts and T&I offerings for offshore wind farm developers and has also worked with major Original Equipment Manufacturers (OEMs) in this sector. Van Oord has developed ports, both on the East as well as the West Coasts, which are close to the proposed offshore wind farm project sites. These ports are needed for handling specialized equipment, turbine cabling systems as well as offshore O&M and crew transfers. Van Oord is already operational in other areas of maritime development off the Gujarat and Tamil Nadu coasts. Van Oord has been operating in India for the last 62 years with a strong presence in the maritime sector and this experience would help in the development of offshore wind projects. The port infrastructure in its current form is not suitable for off-shore wind developments, and Van Oord is fully equipped for the required enhancement of these ports if the government and developers would consider this the right way forward..

Mr. Jakob Friis Sorensen, Managing Director, APM Terminals Pipavav (Gujarat Pipavav Port Ltd)

Gujarat is one of the states with the most advanced port infrastructure, making it the perfect choice for off-shore wind development. The Gujarat Pipavav port is a strategic port for India with a dedicated freight connectivity to the northern markets. The port currently has some facilities that can cater to the off-shore industry, including an adjacent steel manufacturing plant. The Pipavav port is located quite close to the proposed pilot site for the first off-shore wind project. The port has also done a preliminary study into the investment that would be required for catering to the off-shore industry and are eagerly waiting for firm steps to be taken in development of off-shore wind in Gujarat.

Mr. Javier Magro, Business Unit Manager, DEME Off-shore

For Off-shore wind to be a success in India, the country needs to focus on two areas 1) the EU off-shore wind experiences and expertise, not only in construction but also in project structuring, financing, maintenance, etc. and 2) focusing on bringing the right equipment and man-power to develop these projects. Professional EPC contractors would play a critical role in the construction of these projects and India needs to leverage the learnings from the global markets to adopt the best practices and technologies to kickstart its localization efforts.

1.3. Vote of Thanks / Closing remarks

Mr. Poul V. Jensen, Managing Director, European Business and Technology Centre (EBTC)

Mr. Jensen conveyed his appreciation to the Moderator Mr. Nicolas Couderc for an engaging and interesting discussion on the development of off-shore wind supply chain in India. The purpose driven discussion around the opportunities and challenges for the development of the off-shore supply chain as well as installation in India was captured in almost entirety by the various speakers and panelists. The EU Business and technology center and the EU CECP continue to work with Indian and EU stakeholders for the progression of off-shore wind in India and are ready to provide the necessary support wherever necessary.

Mr. Matthieu Craye, International Relations Officer, European Commission,

Mr. Craye thanked the organizers, speakers and participants and welcomed all the concrete ideas shared in the webinar particularly on pilot implementation, cost reduction, price economics, assured offtake, focus on broader picture of policy support and harmonization of certification and standards. He stressed the importance of joining forces in several multilateral and bilateral initiatives to share knowledge and expertise to successfully develop the off-shore wind industry in India.