EU-India Clean Energy and Climate Partnership virtual roundtable on offshore wind focusing on Indian Offshore Port infrastructure

Event Proceedings

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EU-India Clean Energy and Climate Partnership virtual roundtable on off-shore wind focusing on Indian offshore port infrastructure

The EU and India have been closely cooperating in the area of offshore wind, including through the EU funded projects Facilitating Offshore Wind in India (FOWIND) and the First Offshore Wind Project of India (FOWPI), an offshore wind study tour to Europe, an offshore virtual roadshow and several smaller studies.

On 10th June 2022, the EU-India Clean Energy & Climate Partnership (CECP) project (www.cecp-eu.in) hosted a virtual roundtable on "***Offshore wind focusing on Indian port infrastructure***".

The event was attended by more than 200 participants comprising of EU port operators, government officials from Gujarat and Tamil Nadu, National Institute of Wind Energy, offshore wind project developers, turbine manufacturers, Research bodies, Academia, not for profit, etc.

1.1. Opening Remarks & Keynote Address

Mr. Edwin Koekkoek, First Counsellor-Energy and Climate Action, Delegation of European Union to India, welcomed the participants from Europe as well as from India. He talked about the 2016 EU-India Clean energy and climate partnership (CECP), which focusses on the implementation of the Paris Agreement and clean energy transition involving energy efficiency, renewable energy measures and grid integration. He referred to the prior work conducted in the offshore wind space, including the FOWIND project-assessing the potential of offshore wind in India and the FOWPI project that looked in depth into the potential first offshore project in Gujarat. He emphasized the importance of learning from earlier studies in terms of port infrastructure requirements, the existing facilities in Indian ports and how to make them ready for offshore wind development.

1.2. Presentation on key port infrastructure lessons from FOWPI and on Gap Assessment of Training and Skill Building in Offshore Wind Energy Sector in India

Mr. Vibhash Garg, Director, PwC India and Team member - CECP Project discussed the key port infrastructure lessons from FOWPI- focussing on current readiness of Indian ports to facilitate offshore wind and best practices based on EU experiences. He also emphasized the learnings pertaining to port requirements from two key studies 'Supply Chain, Port Infrastructure and Logistics Study for Offshore wind farm development in Gujarat and Tamil Nadu[1]' supported under FOWPI and 'Supply Chain Study for Offshore Wind in India[2]' supported under Business Support to the EU-India Policy Dialogue project. The presentation touched broadly on following topics:

- Key Infrastructure Requirements for Offshore Ports: Ports need to be strategically evaluated on a case-by-case basis for most feasible operations-manufacturing, O&M and marshalling as different operations and components have different handling and storage requirements. Some best practices include:
  - For wind turbine manufacturing port, storage areas with sufficient bearing capacities and area to meet supply chain is needed. Additionally, large workshops for blade, tower and nacelle fabrication/assembly are required
  - 100% accessibility is necessary for an O&M port
  - Detailed cost-benefit analysis is needed to analyse economic sense for opting for marshalling port

[1] https://www.gwec.net/wp-content/uploads/vip/Fowind-study-report_29-06-2016_pages_JWG-update_v2.pdf
[2] https://www.cecp-eu.in/uploads/documents/events/Supply_Chain_study_for_off-shore_wind_in_India.pdf

- Examination of Port Readiness for Different Ports in Gujarat and Tamil Nadu: Total of 8 ports have been identified for uptake of different operational activities for offshore wind in Gujarat (5) and Tamil Nadu (3), mapped with proximity to different wind zones
- Key Recommendations for Indian Ports: No single port in Gujarat and Tamil Nadu is currently fully suitable to facilitate all offshore wind construction activities without some level of adaptation, restructuring of space or relocation of existing port and birth activity. To avoid making serial upgrades and improvements to harbor facilities, future demands and OWF development pipelines should also be taken into consideration when determining port requirements

He also presented the study on '**Gap Assessment of Training and Skill building in Offshore Wind Energy Sector in India.**' He briefed about the long-term goal of 30 GW offshore capacity targeted by GoI by FY 2030 and the recent developments with regards to a phasing strategy that has been developed by MNRE. To achieve this target, indeed a competent workforce with necessary skill set is needed. He briefed participants on the key skills required, current skills available, additional certification needed and various European institutions providing such training that may be targeted for increased collaboration[3]. While India has ample skills available for preliminary project development stage such as site selection, technical feasibility, EIA, geotechnical and geophysical surveys, etc., specific skills for installation, commissioning, and O&M for offshore are absent. Some of the leading institutes in India with relevant skill availability for development phase of offshore include-NIWE, INCOIS, NIO, and IIT Chennai.

He also stressed the key improvement needs in the offshore wind ecosystem in India in terms of more comprehensive training courses, qualified trainers, training institutes and certifications. Finally, few action areas pertaining to offshore skill development framework were discussed. The presentation touched broadly on:

- Employment and Skill Mapping Across Offshore Wind Supply Chain: Skills required in the project development phase are available in India, whereas additional skill/certification is needed for construction and operation phases of the project. Global Wind Organization (GWO) certification for personnel working at sea and height is mandatory. Specific Marine and Logistics Certifications[2] for Vessel Master, Vessel Mate and Deckhand and UXO Diver also need be targeted.
- Key Improvement Needs in Offshore Wind Sector Skills in India: There is a need for training institutes and certified courses, training curriculums, including benchmarking of skill sets. Collaborations/tie-ups among industries for offshore wind is essential.
- Action areas for enhancing offshore skill development framework: Developing qualification packs (QPs), leveraging skills from offshore oil and gas, creating offshore knowledge portal, and developing concrete education and training courses at university level are some of the key areas of intervention that have been identified

The detailed presentation can be assessed here.

Finally, the report on 'Gap Assessment of Training and Skill building in Offshore Wind Energy Sector in India' was officially launched during the webinar by Dr. Balaraman Kannan, Director General, National institute of Wind Energy (NIWE) and by Mr. Edwin Koekkoek, First Counsellor-Energy and Climate Action, Delegation of European Union to India.

1.3. Presentation on Indian offshore market: key developments and opportunities

Dr. K. Balaraman, Director General, National Institute of Wind Energy briefed the participants about the proposed offshore wind zones in Gujarat and Tamil Nadu, translating into a potential of 40 GW and 30 GW

[3] EU based institutions providing training-Relyon Nutec, Global Wind Academy, Deutsche WindGuard Offshore, Deutsche Windtechnik, FMTC Safety, Health Safety Expert, RT9, Skylotec, Astutis, Lloyd's register, British Safety Council, etc.

offshore capacity[4] respectively. He also emphasized on the future course of action in terms of planned trajectory for uptake of offshore, targeting 4 GW per year for a period of 3 years from FY 2022-23 onwards, which would subsequently be ramped up to 5 GW per year from FY 2026 to FY 2030. The mode of power sale will be through open access/captive/bilateral third-party sale/merchant sale. He also shared tentative layouts of micrositing and power evacuation facility for the proposed 1 GW offshore wind farm project at Gulf of Khambat, Gujarat. Additionally, he highlighted a key policy rolled out by Govt. of India for setting up manufacturing zone for power projects (including renewable energy) on pilot basis, with an outlay of INR 400 Cr (approx. € 50 million) over a period of 5 years that can help facilitate offshore wind manufacturing.

He also discussed in detail NIWE's Vayumitra Skill Development Program (VSDP) – key objectives, courses, framework and financing by MNRE. A similar program in offshore wind is required, specially with reference to development of qualification packs (QPs), which could lead to design of courses, training of trainers, and other associated activities. He also mentioned about NIWE's plan for developing an offshore wind demonstration, research, skilling and testing centre at Dhanuskodi, Rameshwaram, Tamil Nadu featuring offshore wind turbine (2 turbine of 8 MW size), and 2 beds for testing of wind turbines for practical training purposes.

Finally, he highlighted the growing role of ports and logistics and how port infrastructure would become centres of economic activity, in addition to contributing to offshore wind energy industry.

1.4. Presentation on Indian Port Readiness for Offshore Project Development

Mr. Jakob Friis Sorensen, Managing Director and **Mr. Amit Nandoskar**, AGM–APM Terminals Pipavav (Gujarat Pipavav Port Ltd.) emphasized the port's importance in establishing India's foray into offshore wind, especially considering its close proximity (~25km) to shortlisted offshore zones in Gujarat region. They briefed about the bulk cargo shipments handled by the port, including prior experience in offshore base/long term campaign for oil and gas sector that will come handy for offshore wind development. They talked about the strategic groundwork conducted so far with reference to 'Zone B', including estimation of logistics costs based on Oil & Gas (O&G) practical experiences. He stressed on how Pipavav port will primarily play the role of 'Marshalling port' to support installation of windmill components covering- receiving and unloading of components from import cargo vessels and storage, assembly and load-out of assembled components onto installation vessels, and base port for O&M after commissioning. Further, he discussed several infrastructure, operational and cost related challenges for ports. The focus should also be on providing timelines for making port ready, rather than exclusively relying on targets for offshore wind development. He indicated that to date, Pipavav port is yet to develop infrastructure to handle offshore windmill installations and that ports would need to incur considerable investments to upgrade its facilities involving berth, back up yards, heavy equipment-cranes, Self-Propelled Modular Transporters (SPMTs), skilled resources, etc. In this context, he mentioned that they have already conducted benchmarking exercise to map readiness of port considering Asian environment using Taichung Port (recent Taiwan commissioning as Marshalling Port), which took 3 years to develop port readiness.

He recommended engaging with experienced players and visit to a few existing wind energy ports for better understanding. Pipavav port has already been engaging with experienced offshore developers and marshalling ports from Europe to better understand the requirements.

The detailed presentation can be accessed here.

Shri T.K. Ramachandran, Chairman, V.O. Chidambaranar Port Authority, Tuticorin emphasized the strategic location of the port near Chennai that makes it one of the few ports that can easily service areas to the South of India, which have now been identified as potential sites for offshore wind development. He indicated vital infrastructure requisites for offshore wind including- land for assembling and manufacturing, storage facility, berth infra, handling facility, logistics movement, proximity to identified

[4] Assuming 4.5 MW/sqkm of seabed area

wind potential area, and proximity for power evacuation and how the port is well-equipped to smoothly deliver on all these necessary requirements. Some of the key distinguishable features of the existing port infrastructure include:

- 4000 Acres of land availability at cheaper rates (INR 130,000/annum lease) providing all advantages of offshore in terms of wind speed and benefits of onshore wind in terms of setting up necessary infrastructure
- 16 berths of different quay length (highest 334.5m with a depth of 14.2 m) that can be used for different purposes, including supporting wind turbines if they must be launched into the ship.
- significant expertise in logistics: Handled 3000 wind turbine logistics in the year
- Vast storage area for manufacturing WTG components
- Modernized crane and crane facility for handling
- WTG shipment is becoming a prominent cargo to VOCPA
- Sufficient stack area near the berths for evacuation
- Availability of cost effective skilled, semiskilled, and unskilled work for vessel handling, erection, O&M and other activities
- Excellent connectivity via road, rail and air- well connected and congestion free transport
- Excellent power evacuation: Central electricity grid at 400 kV level at 40 km distance; State electricity grid pooling station at 220 kV is available within 1 km from port boundary

The detailed presentation can be accessed here

1.5. Presentation on key requirements for offshore ports and best practices and lessons learned in European Ports

Mr. Erik Betholet, Business Manager, logistics & offshore wind of Eemshaven port talked about the overall experience of Eemshaven port as a main hub for offshore wind industry in the region, supporting 17 windfarms installed from port, 4 windfarms O&M, 2 repowering and 1 under construction. The port is currently used as base, service, marshalling and shelter port, but not as production port as components are sourced from different locations. For the largest windfarm in the world Horsea Two (UK), the port was involved in the foundations (165 monopiles) logistics, while turbines came from Esbjerg port. Key maritime offshore wind industry requirements met by port include:

- Draught: 7.5-14m
- Quay length: 5085 m (public and private)
- Approx 60 hectare offshore sites available
- Limited tidal range (2.5 m)
- Heavy load quays; 30 tons/sqm; 20 tons/sqm; 10 tons/sqm
- Jetty length: 1130 m
- Width of fairway and basin(s): 110-350 m
- No infrastructural restrictions sail in/out (power lines, bridges, locks, etc.)
- Wide port entrance to transport assembled 3 bladed rotors

He then discussed some of the challenges the offshore wind industry is facing in terms of larger turbines, longer blades, heavier components, larger support vessels, larger installation vessels, large offshore wind farms, longer distance from shore, and increased water depth. He briefed about the skilling initiatives undertaken by the port such as the Offshore Wind Innovation Centre (OWIC) for training and innovation on O&M for offshore wind farms and Cable Centre Eemshaven (CCE) that offers specific training and education in the field of cable installation, maintenance, and repair. As part of the NortH2 consortium, he highlighted one of the innovative projects being undertaken involving large scale green hydrogen production using offshore wind.

He recommended collaboration among multiple ports as the key to realize the target of 30 GW, and that no single port must necessarily take up all offshore related activities.

The detailed presentation can be accessed here.

Mr. Jesper Bank, CCO, Port Esbjerg talked about how wind energy turbine is becoming mainstream in port's business, yielding 55% of the revenue in the year comprising of both export of onshore turbines and export/installation of offshore turbines. He stressed on the fact that since offshore business is a tender driven market, ports also need to engage in multipurpose activities to justify business case. He indicated several marquee characteristics of the port such as size (4,500,000 sqm), quay length (14km), water depth (10.5 m), and installation vessels (>100), including offshore turbine shipments handled, totaling to 4150+ offshore turbines with a capacity of 23.6 GW. He also recommended considering scaling up process (turbine size, vessel size, etc.), as a key component, while planning for offshore infrastructure development. He emphasized on the diverse role played by the ports in terms of installation, production, O&M and other activities of decommissioning, vessel services, repowering, etc. mapping investment and project duration. He demonstrated key aspects of Esbjerg port through layouts and designs for preassembly/project installation, storage, quay side, installation vessel, O&M activities, vessel services, production, etc. He also stressed on the importance of training and certification with the evolving offshore wind industry.

The detailed presentation can be accessed here.

1.6. Consolidation of thoughts & vote of thanks

Mr. Vibhash Garg, Director, PwC India and Team member - CECP Project and **Mr. Edwin Koekkoek,** First Counsellor-Energy and Climate Action, Delegation of European Union to India thanked the speakers from EU and India for sharing key insights and knowledge around offshore energy port infrastructure. Mr Edwin stressed the importance of further increased cooperation between India and Europe on port infrastructure and on skill development.

Annexure 1: Agenda

EU-India Clean Energy & Climate Partnership virtual roundtable on Off-shore wind focusing on Indian Offshore Port infrastructure

Date: 10th June 2022 (Friday)

Time: 10:00 hrs to 12:00 hrs CET / 13:30 hrs to 15:30 hrs IST

TIME (CET)	TIME (IST)	Agenda
10:00–10:10	13:30–13:40	**Opening remarks, welcome of participants and keynote address** Mr. Edwin Koekkoek, First Counsellor- Energy and Climate Action, Delegation of the European Union to India
10:10-10:20	13:40-13:50	**Presentation on key port infrastructure lessons from FOWPI** and on study on **'Gap assessment of training and skill building in offshore wind energy sector in India'** Mr. Vibhash Garg - EU CECP Project, PwC India
		Launch study on gap analysis of skills
10:20-10:30	13:50-14:00	**Presentation on Indian offshore market: key developments and opportunities** Dr. K. Balaraman, Director General, National Institute of Wind Energy
10:30-11:00	14:00-14:30	**Presentations on Indian port readiness for offshore project development** 1. Mr. Jakob Friis Sorensen, Managing Director – APM Terminals Pipavav (Gujarat Pipavav Port Ltd.) 2. Shri T.K. Ramachandran, Chairman, V.O. Chidambaranar Port Authority, Tuticorin
11:00-11:45	14:30-15:15	**Presentation on key requirements for offshore ports and best practices and lessons learned in European ports** 1. Mr. Erik Betholet, Business Manager, logistics & offshore wind of Eemshaven port 2. Mr. Jesper Bank, CCO, Port Esbjerg
11:45-11:55	15:15-15:25	**Open discussion on infrastructure and port requirements**
11:55-12:00	15:25-15:30	**Consolidation of thoughts & vote of thanks**