



Offshore Wind Roadshow

Delegation of The European Union to India





Gap Assessment of Training and Skill Building in Offshore Wind Energy Sector in India

Background and Objectives of the report

Background -

- The Ministry of New & Renewable Energy notified the National Offshore Wind Policy in October 2015, to realize the Offshore wind power potential in the country.
- To instil confidence in the wind industry, the government also declared a long-term target of 30 GW offshore wind power capacity addition by 2030.
- Development of an offshore wind sector in India will require local training and skill development programs. It is thus relevant to take stock of the current situation with respect to active institutions, available training, key gaps, training requirements in the sector.

Objectives of the report -

- Assessment of the Key institutes active in Wind energy/ Offshore training programs in India
- Identification of the gaps and needed skills in the offshore wind sector value chain i.e., the development phase, construction phase and operation phase
- Mapping of EU's technical expertise in training and capacity building
- Key recommendations to improve the offshore wind sector skill base in India



Employment and Skill Mapping Across Offshore Supply Chain

India currently lacks major skills in the construction and operations phase of offshore wind project development

	Key Skills Required	Skill Availability in India	Additional skill/certification requirement	EU based institutions providing training
Development Phase	<ul style="list-style-type: none"> • Site selection and project development • EIA and Wildlife Survey • Technical and financial feasibility • Wind farm layout and port studies • Geotechnical & geophysical survey • Engineering R&D and design • Tender support 	<ul style="list-style-type: none"> • Skills related to wind and oceanic measurement, geophysical and geotechnical services, bathymetry, seabed engineering, EIA inspection, numerical modelling of offshore structures • Key Institutes: NIWE, INCOIS NIO, IIT Chennai 	<ul style="list-style-type: none"> • Health and Safety “HSE” practices through inclusion of HSE manager with NEBOSH¹ Diploma • Specific Marine and Logistics Certifications² for Vessel Master, Vessel Mate and Deckhand and UXO Diver 	<ul style="list-style-type: none"> ▪ Focus on Training ▪ Astutis ▪ British Safety Council ▪ Lloyd’s Register ▪ The Knowledge Academy
Construction Phase	<ul style="list-style-type: none"> • Specific skills in core areas of: <ul style="list-style-type: none"> ➢ Tower manufacturing and supply ➢ Foundation manufacturing and supply ➢ Foundation Installation ➢ Turbine Installation ➢ Array Cable Installation ➢ Installation Support and Logic 	<ul style="list-style-type: none"> • Most of the skills are absent • IIT Chennai offers specific skills relating to Installation and design of offshore structures, and subsea engineering 	<ul style="list-style-type: none"> ▪ Health and Safety “HSE” practices through inclusion of HSE manager with NEBOSH¹ Diploma ▪ GWO³ certification for personnel working at sea and height 	<ul style="list-style-type: none"> ▪ RelyOn Nutec ▪ Global Wind Academy ▪ Deutsche WindGuard Offshore ▪ Deutsche Windtechnik ▪ FMTC Safety ▪ STC KNRM
Operation Phase	<ul style="list-style-type: none"> • Specific skills in core areas of: <ul style="list-style-type: none"> ➢ Wind farm operations ➢ Turbine Maintenance ➢ Structural inspection and maintenance ➢ Maintenance and logistics service 	<ul style="list-style-type: none"> • Most of the skills are absent 	<ul style="list-style-type: none"> ▪ IRATA certification level (1-3) for personnel working at height ▪ Health and Safety “HSE” practices through inclusion of HSE manager with NEBOSH¹ Diploma ▪ GWO³ certification for personnel working at sea and height 	<ul style="list-style-type: none"> ▪ Altitude Above All Training ▪ RT9 ▪ Skylotec ▪ Vertex Training Solutions ▪ Ascent Safety ▪ Health Safety Expert

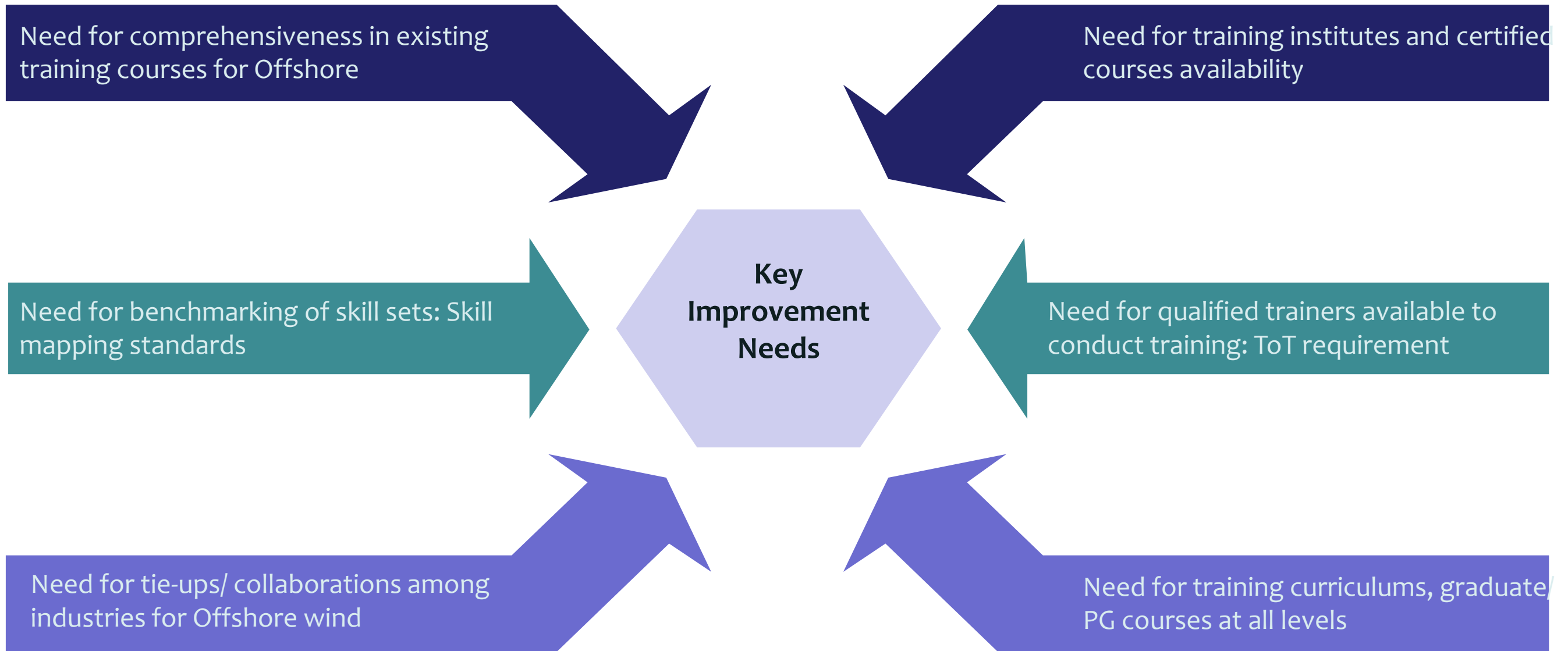
1. National Examination Board in Occupational Safety (NEBOSH)

2. Vessel Master: Certification for Seafarers; Vessel Mate and deckhand: Basic Seafarer Training; UXO (unexploded ordnance) Diver: Explosive Ordnance Disposal Qualification, Diver certificate

3. Global Wind Organization



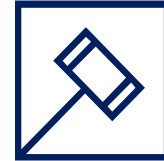
Key Improvement Needs in Offshore Wind Sector Skills in India



Action areas for enhancing offshore skill development framework



Development of Qualification Packs (QPs) for Offshore Wind



Creation of conducive policy environment



Institutional level capacity building of certain institutes



Developing concrete education and training courses at university level



Leverage skills from Offshore Oil and Gas



Utilization of collaboration opportunities for R&D institutional development



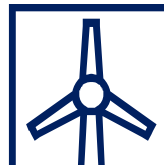
Creation of offshore knowledge portal



Creation of tools/frameworks for financial institutions



Utilization of collaboration opportunities for certification



Share experiences gained with work and peer training



Offshore Wind Supply Chain: Challenges Vs Opportunities



Key Offshore Wind Supply Chain Related Challenges in India



Project Pipeline and Approval Process

- No clear policy roadmap, firm commitments, and regulatory mechanism for the industry
- Lack of body of knowledge that documents and disseminates the details of the approval process, rulemaking and implementation to wider offshore community
- In Germany, the BSH has developed knowledge repositories to help navigate approval process and easy stakeholder engagement resulting in continued success



Support Mechanism

- Lack of support mechanisms for offshore wind. Specific areas could be targeted
 - Obligate DISCOMs to purchase offshore power
 - Feed-in-tariff
 - Favourable Tax Rates
 - Interest Rate Rebates
 - Encourage Corporate PPAs



Logistics and Infrastructure

- Significant cost of logistics affecting export: Logistics costs in India add 15 % to costs of wind technology
- Complex logistics (particularly relating to vessel) in offshore requiring scheduling far in advance has affected rollout of wind in India



Key Offshore Wind Supply Chain Related Opportunities in India



Jobs

- Ample skilled/unskilled steady jobs in key areas of offshore maintenance , port development and EIA ; **In Germany 8 GW of offshore wind installation has provided jobs to 20,000 people**
- Local content requirement can further create additional jobs, particularly in manufacturing
- Greater job creation potential than onshore; **Offshore wind industry in UK employs more than 50% of workforce despite accounting for only 30% of the total wind power capacity;**



Manufacturing

- Growth of local supply chain on account of investments as multi-GW pipeline consolidates
- Leveraging synergies with O&G sector; Companies such as L&T, OHCS India, and Param Offshore have construction and logistics experience directly transferable to offshore wind



Research and Development

- Research opportunities on production of advanced technologies in India, strengthening innovation and workforce development to stimulate Make in India initiative
- Research efforts on combining offshore wind with battery storage, hydrogen production, and energy islands



Vessels

- Opportunity for international vessel suppliers to service the Indian market with specialized solutions for offshore wind in the short term and establish vessel manufacturing in long term
- Opportunity for Indian shipyard expansion; **European shipbuilders like DAMEN, Royal IHC, Ulstein etc. could also collaborate with Indian public and private sector shipyards like CSL, GSL or L&T for shipbuilding**



Thank you



Annexure



Key Institutes in India and EU

Indian institutes

- NIWE (National Institute of Wind Energy)
- SCGJ (Skill Council for Green Jobs)
- INCOIS (Indian National Centre for Ocean Information Services)
- NIO (National Institute of Oceanography)
- IIT Chennai (Madras)

EU Institutes

Universities and institutes (examples)

- Ghent University
- Vrije Universteit Brussel
- Technical University Denmark
- Aalborg University
- Technical University of Munich
- Carl von Ossietzky University of Oldenburg
- Left University of Technology, Netherlands
- Universiteit Twente
- Fraunhofer IWES Germany
- TNO Netherlands
- DHI Denmark
- MaREI Ireland
- Chalmers University of Technology Sweden



Key Institutes in India and EU

Indian Training Providers

Private training providers

- Elite
 - Mærsk
 - Sagar
-
- Synergies with oil & gas sector

EU Training Providers

Private training providers

- Mærsk: Global company within wind
- BFW: Offers vocational education
- Global Wind Academy: GWO certified safety and technical courses
- Danish Wind Power Academy: Courses included optimization of components
- Lucas-Nülle: Training systems facilitating hands-on learning
- Monsson, Renewable Energy School of Skills: GWO and BZEE certified wind energy training programs
- Vulcan Training and Consultancy: Offers GWO certified safety training programs

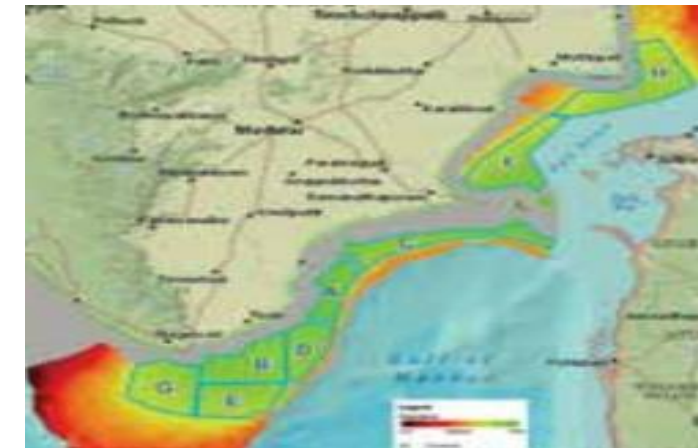
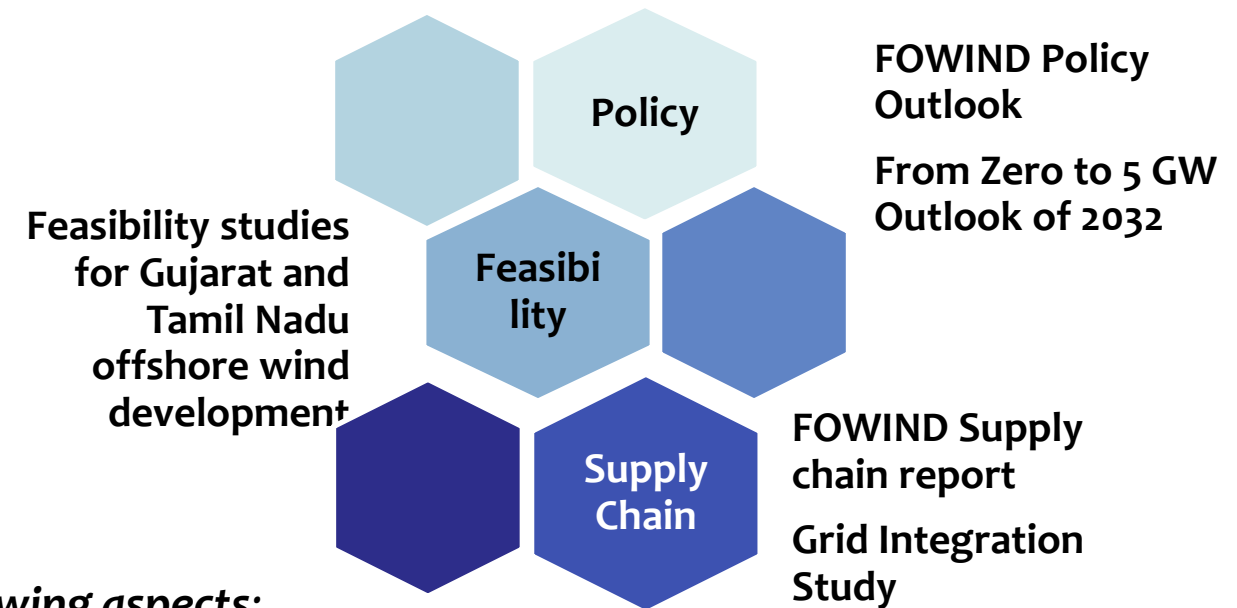


FOWIND laid the groundwork for offshore wind power development

➤ **FOWIND released various reports to help investors to evaluate business opportunity in offshore wind in India**

➤ **The feasibility study for Gujarat and Tamil Nadu cover the following aspects:**

- Wind resource assessment
- Wave and current study
- Geotechnical conditions
- Selection of potential wind sites
- Turbine selection
- Windfarm layout
- Energy yield estimation
- Electrical concept
- Foundation concept
- Installation and logistics
- Risks



Wind zones in Gujarat and Tamilnadu

These reports provide a good starting points for private players to further analyse the investment opportunities in Gujarat and Tamil Nadu offshore wind development.



First Offshore Wind Project of India (FOWPI)

- FOWPI played an instrumental role in strengthening country's offshore wind sector by providing TA in implementation of 200 MW project near Gulf of Khambhat, Gujarat
- FOWPI was led by COWI A/S Denmark with local key-support provided by WinDForce Management Services Ltd and COWI India Ltd involved in the project implementation. The program was well supported by EU, MNRE and NIWE.
- The project was successfully completed in 42 months: Jan 2016-June 2019

Key Focus Areas Covered Under FOWPI

Building of Knowledge Banking & Capacity building

Preliminary drawing of Farm Layout and Energy Yield Estimates

Environmental Impact Assessment- Scoping

Carrying out Geophysical studies

Preliminary foundation design, including appurtenances

Preliminary Electrical Services

Coastal and Onshore identification

Financial Modelling

Permits and Procedures

Key Reports Developed under FOWPI

Metocean Study Report

Electrical Design Report

Wind turbine layout and AEP report

Environment scoping report

Coastal and port aspects

Procedures for offshore

Weather windows for installations

Recommendations on EIA framework

