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INFRASTRUCTURE PREPAREDNESS FOR THE DEVELOPMENT OF OFFSHORE WIND SECTOR IN INDIA

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Renewable energy technologies are witnessing a fast-paced growth globally at 8.33%, supported by government policy. Offshore wind technology, although a recent entrant into the arena, has already witnessed a cumulative capacity of 8,771 MW in 2014 - representing a sizeable 12.6% of the annual EU wind energy market. This is expected to grow to 40 GW by 2020. UK, Denmark, Germany, Belgium and China are currently the leading countries in installing offshore wind turbines and are expected to contribute to most of this growth in installed capacity.

India already has a significant experience in wind technologies and ranks 5th globally in onshore wind. Along with the strategic advantage offered by a 7,516 km coastline, it is appropriate that India starts exploring its offshore wind potential. Preliminary analysis indicate that the states of Gujarat and Tamil Nadu could contribute to the RE portfolio in India due to the availability of high speed winds along the coast in these states.

However, the immediate question arises – How prepared is India for offshore wind farm development?

A busy VOC Tuticorin port

Offshore wind project development can be a complex jigsaw puzzle for planners and policy makers as it requires several seemingly disparate pieces fitting together perfectly. Offshore wind development will necessitate readiness of ports, grids, and supply chain related logistics – all eventually coming together in tandem. As significant coordination between ministries and other institutions in private and public sector will be a key component for successful implementation, it becomes all the more critical to look into the details. It is imperative that Indian policy makers assess initial hurdles faced by European countries, and learn from the global offshore wind industry experiences.

In early years of European offshore infrastructure development, developers imbibed practices adopted by companies that were involved in manufacturing onshore wind components or surveying seabed for oil and gas availability through customised vessels. These industries were already proficient in some technical abilities, such as, windmill component manufacturing, refurbishing vessels for oil & gas industry sites, fabrication facilities for foundation structures etc. For India, learning from these experiences will help in developing a robust supply chain network and aid in building necessary human resource base so that a platform can be set up for the development of offshore wind farms in the near future. In order to integrate existing infrastructure assets seamlessly and costeffectively, India needs to identify such facilities that can support this emerging industry with minimum additional investments at least for initiating some of the pilot projects. Nevertheless, as the market is expected to mature in the years to come, a dedicated supply chain for construction of offshore wind farms should also be looked into.

As per The European Wind Energy Association (EWEA), the time required for the construction of a 300 MW offshore wind farm typically ranges

between 24 to 72 months. Key factors that influence the project timeline include distance to the shore, port facilities, power evacuation facility, possibility of expansion of the grid, vessel dimension requirements for transportation of wind turbine components and supply chain logistics. Timely availability and execution of these components have a significant impact on the successful functioning of the offshore wind project. Unlike onshore renewable projects, unpredictable climatic conditions may adversely affect the installation and maintenance activities. Delay in construction would not only halt the progress but also escalate overall project costs.

Vessels harboured at the South Breakwater in VOC port, Tuticorin

The FOWIND prefeasibility study findings suggest that there are 43 ports in Gujarat and 26 ports in Tamil Nadu which could be assessed for offshore wind development. However, as the existing ports have not been designed with offshore wind sector development in mind, these ports lack adequate storage capacity, construction space and construction related facilities. Further, key factors, such as, ground bearing capacity, water depth, channel width, distance from the wind farm, staging port and transportation facilities available to transport heavy wind turbine components need to be assessed right at the planning stage.

A close vicinity of turbine manufacturers, cable suppliers, vessel operators and marine installation companies reduces the time and logistics cost of transporting components via road. In Tamil Nadu L&T Kattupalli port and V. O. Chidambaram port in Tuticorin are some good examples. While L&T has a port, ship building unit and modular fabrication facility unit at the same location, Tuticorin has a port and ship breaking facility in the same town. In Gujarat Adani port in Hazira have multipurpose capabilities and L&T's HZMC (Hazira Manufacturing Complex) has ship building, heavy engineering & manufacturing and fabrication facility. Another port Pipavav has availability of land parcels, internal roads, storage facility and a ship building yard. Further ports, where basic facilities needed for an offshore wind farm are already in place, need to be identified and developed further.

In view of the government's mission to enhance the share of energy for wind source from 23,444 MW capacities (as on March 31, 2015) to 60,000 MW by 2022, adequate port infrastructure may propel the development in a positive direction. According to the Load Generation Balance Report, energy and peak deficits stood at 4.2% and 4.5%, respectively, for the financial year 2013-14. The development of large-scale offshore wind farms may help in the reduction of energy deficits in the country in the near future. Nevertheless, need for preparedness of grid to avoid evacuation risk for any prospective offshore wind investor should also be looked into.

The development of port infrastructure and localisation of supply chain can be beneficial in terms of creating jobs and maximising skill capabilities. Based on the studies conducted by Ernst and Young in 2012, wind power industry creates 21,000 jobs every year for every billion invested in offshore wind in EU.

“Make in India” is a national program which aims to transform India into a global manufacturing hub. Offshore wind development must be evaluated to identify synergies with this program in order to motivate turbine manufacturers and other local industries to set up local manufacturing units in India. Moreover, opportunities for economic activities in and around the port area lie even after construction of offshore wind farms as vessels and port facilities will be utilised for regular maintenance of wind farms throughout the lifetime of the project.

Lastly, enhancing the capability of infrastructure would help the state and central government in identifying various policy and regulatory interventions that would be required for the speedy development of the offshore wind sector in India. FOWIND, in its upcoming reports, will help the regulators, manufacturers and decision makers in understanding the status of infrastructure, supply chain and logistics available in India for the development of offshore wind sector.

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