

Taiwan: The new offshore wind hotspot

Taiwan is an offshore wind hotspot with key players such as Orsted (formerly Dong), Siemens, Macquarie and Mitsubishi Generation investing to capture early mover advantage. The focus by developers and investors on Taiwan is due to strong government commitment to an ambitious windfarm programme; a high Feed in Tariff (FIT); a positive business environment and a potential base for offshore wind throughout South-East Asia.

The offshore wind programme is a critical part of plans to replace nuclear power which will be shut-down due to safety concerns. By 2025, the government plans the installation of 600 offshore wind turbines with a total capacity of 3GW under the FIT regime; and a further 2.5GW through competitive auctions. The first, demonstration projects in the Taiwan straits are shown in Figure 1.

Figure 1: Demonstration Offshore Wind Projects



Source Google maps and CmY

Under the Renewable Energy Act of 2009, the government provides a twenty-year PPA and an attractive FIT. Based on advice from an independent committee, the value of the FIT is revised annually which encourages developers to move quickly to lock in the FIT at its current level. In principle, the tariff is no lower than the average cost of domestic fossil-fuelled power. The 2018 FIT for offshore wind energy is NT\$5.8498 / KWh (US\$0.195 / KWh) which is significantly higher than in other major offshore wind markets.

Demonstration windfarms

Demonstration windfarms totalling 350MW are being developed and their initial phases enjoy a subsidy of up to 50% of the installation costs. The windfarms are:

- Formosa 1 owned by Macquarie, Orsted and Swancor - Phase 1 is an operational 8MW project and Phase 2 (120MW) has its environmental permit
- Taiwan Generations Corporation, Century Iron and Steel Industrial Co and CSBC have founded two projects: Fuhai a 120 MW project whose design is being revised to address environmental concerns,
- Government owned Taiwan Power Co (Taipower) has recently re-tendered for an EPC contractor for its 110 MW Changhua project

ZAP projects

There is strong competition among project developers to get their projects to be part of the further 520MW of generation capacity planned by 2020 under the Zone Application for Planning (ZAP) programme. The government is awarding environmental permits, offshore wind preparation permits and grid capacity on a "*first come, first served basis*".

Taiwan's Bureau of Energy has designated 36 Zones of Potential (ZoP) for development of commercial windfarms. As Environmental Impact Assessments (EIAs) are evaluated on a first-come, first-serve basis, if a ZOP has more than one application, the first developer to get EIA approval will have priority for a development preparation permit for that ZoP.

The Bureau of Energy will issue EIA approval by the end of 2017 and will issue development preparation permits up to the end of 2019. So far 24 planning applications have been registered with total capacity of about 11GW.

Grid connections

Project developers are responsible for connecting their projects to the electricity grid owned and operated by Taipower. Taipower plan to build out 3.5GW of grid connection in Changhua where the bulk of the projects built before 2025 are expected to come ashore.

In the first quarter of 2018 a “grid allocation” competition will be run for projects which have successfully passed their EIA.

Wind resource

There is good wind and shallow water in the Taiwan straits. Analysis by Taiwan’s Industrial Technology Research Institute (ITRI) estimates 1.2GW of windfarms are feasible in waters shallower than 20m, and a further 5GW in depths of 20m-50m. Based on NASA satellite data, 4c Offshore estimate the mean wind speed (2000 – 2009) for Formosa 1, Phase 1 as 11.8 metres per second. It is important, that this average includes the seasonal typhon winds to which Taiwan is subject.

Financing

To get the offshore wind industry in Taiwan operating at scale substantial foreign finance will be required. More than £15bn of investment in infrastructure (windfarms, the electricity grid and ports) is required to achieve Government’s 2025 targets. While international banks have great experience managing the risk of such projects, local banks are learning about offshore wind and project finance. It is expected that the bulk of the finance for the windfarms will come from consortia containing both local and international banks. The local banks will contribute local knowledge and connections while international banks bring large balance sheets and experience funding major offshore windfarms.

An attractive business environment

Taiwan's business environment is attractive: The World Bank ranks it 11th out of 190 in its Doing Business 2017 league table. The government is actively seeking foreign expertise and investment to deliver offshore wind projects and to establish Taiwan as a hub for the marine aspects of offshore wind in South-East Asia.

There are significant opportunities now for the international offshore wind supply chain in this fast-growing, open market, particularly in the provision of finance, and technical, legal and commercial advisory services. Investors and service

suppliers need to move quickly as major players such as Northland, Linklaters, Copenhagen Investment Partners, Mitsubishi, Semco Maritime, K2 Management and HSBC are already established.

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