Asian offshore markets show exceptional growth in 2019

Activity and development of the industry continues to grow within the region.

With 6.1 GW new capacity added, 2019 was the best year in history for the global offshore wind industry, according to Global Wind Energy Council's (GWEC) Global Offshore Wind Report. The global offshore market grew on average by 24% each year since 2013, bringing the total installations to 29.1 GW, which accounted for 5% of total global wind capacity at the end of 2019. The UK, Germany, China, Denmark, and Belgium were noted as the top five offshore wind markets in total installations.

Meanwhile, Europe remains the largest offshore market as of the end of 2019, making up 75% of total global offshore wind installation. However, the activity level in Asia keeps increasing with China taking the lead followed by Taiwan, Vietnam, Japan, and South Korea.

Development in the Asian offshore markets was remarkable with China achieving a new record in 2019, installing 2.4 GW offshore wind in a single year and Japan accelerating offshore wind development with its first offshore wind auction launched in summer 2020.

Positive steps were also made in Taiwan as it connected its first utility-scale offshore project to the grid. A further 10 GW is also planned to be installed offshore from the island between 2026 and 2035, on top of the 5.6 GW offshore wind to be installed by 2025.

Changes in the Asian offshore markets

Japan built Asia's first offshore wind project with two units of V47-660kW turbines in 2003. However, GWEC notes that the Asian offshore market was not ready to take off in earnest until 2014, when the Chinese central government released the National Offshore Wind Development Plan (2014-2016).

In 2017, China passed the 1GW annual installation milestone; one year later, it surpassed the UK as the world's top market in new installations.

At present, project developers and investors are rushing to commission their projects before the end of the 2021 deadline in order to capitalise on the 0.85RMB/kWh FIT for offshore wind.

Considering the extraordinary volume of new capacity (4-5 GW/year) will be built in 2020 and 2021, GWEC Market Intelligence expects China will surpass the UK as the world's largest offshore market in total installations by 2021, if not 2020. However, new installations will decline dramatically from 2022, when the central government will terminate the subsidy for offshore wind. Annual offshore wind growth in China in the future will depend on whether subsidies provided by provincial governments will be available and whether offshore wind industry can reach grid parity before 2025.

GWEC Market Intelligence's market outlook predicts that China will continue to dominate the Asian offshore wind market in the first half of this decade, with more than 70% market share, whilst Taiwan is expected to be the largest offshore market in Asia after China.

However, the report notes that the scales will tip from 2025, when more utility-scale offshore wind projects get connected in Japan, South Korea, and Vietnam. China's market share in this region is likely to drop to 58% in 2025 and will continue to decline when offshore projects expand to new markets with high resource potential, like India and the Philippines, towards the end of the decade.

Moreover, the average annual growth rate in Asia will stay at the level of 1.7% in the first half of this decade, but is likely to increase to 8.4% in the second half. China (52 GW), Taiwan (10.5 GW), South Korea (7.9 GW), Japan (7.4 GW), and Vietnam (5.2 GW) are expected to be the top five markets in this region for new installations in the decade.

However, the report notes that excluding China, the Asian offshore wind market is still at the early stage of development. Each market is facing the challenge of developing a local supply chain and the necessary competencies and capabilities to build an offshore wind industry.

The early experience from Taiwan has proven that collaboration with European partners across markets in this region is essential for success.

GWEC Market Intelligence predicts that Europe will still remain as the largest offshore market globally.
Global offshore wind growth to 2030

Source: GWEC Market Intelligence

The new Offshore Wind Taskforce will play a key role in developing a sustainable wind industry in Japan.

Analysis: Offshore Wind

Regional offshore wind market in terms of total installations by 2025 and 2030. Nevertheless, Asia’s share of the global market is expected to grow from 24% in 2019 to 42% in 2025, where it is likely to remain until the end of the decade.

Emerging markets

Taiwan

Taiwan is heating up as the second-largest offshore wind market in the Asia-Pacific region, after Mainland China. Ambitious capacity targets set by the DPP government have attracted eager interest from leading offshore wind developers and technology providers. Already, 128 MW of offshore capacity has been installed at Formosa 1, Taiwan’s first commercial-scale offshore wind farm in Miaoli County, and a further 109 MW is due to come online from the Changhua County project by the end of 2020.

Offshore wind is a key component of Taiwan’s green economy vision, which charts a nuclear-free pathway to generate 20% of electricity through renewable energy by 2025. The government is aiming to install 5.7GW of offshore wind by 2025, and in late 2019 announced that it would double its ambitions to 10 GW over the 2026-2035 period. While the 5.7GW tranche was procured across a selection round and auction, the next 10 GW (termed Round 3) will likely be conducted across two phases.

Following government delays due to COVID-19, a draft version of the Round 3 framework, including how much volume will be allocated and when, is due to be published by end of this year, with a selection round and auction, the next 10 GW (termed Round 3) will likely be conducted across two phases.

Critical to the steady progression of the market will be the government’s localisation strategy, which aims to consolidate the entire supply chain in Taiwan, from turbine components to submarine cables to shipbuilding. The industry must balance growth with local content requirements that are expected to be higher in Round 3.

Within the year, positive signs have already been marked by announcements for an MHI Vestas-Tien Li blade manufacturing facility in Taichung, an SGRE nacelle production facility in Taichung and CDWE’s work on the first Taiwan-built offshore wind installation vessel. But how flexible the localisation requirements are in the forthcoming Round 3 framework will be key to determining whether the nascent offshore wind industry can develop into a sustainable and competitive market.

Over the next decade, Taiwan will achieve more than 10 GW of installed offshore wind capacity, becoming an experienced market with an established domestic supply chain.

Japan

Japan’s offshore wind market has taken time to develop, with the first pilot projects going into the water back in 2003. In the years following the Fukushima nuclear accident in 2011, there was renewed commitment and activity, with both fixed and floating foundations being deployed at faster rates.

To date, no commercial-scale offshore projects greater than 20 MW have been installed and the development of a viable market structure is emerging at a slow pace. But 2020 marks an inflection point for Japan’s offshore wind sector.

The government launched the first offshore wind auction in the general common sea in June 2020 and the other four promising sea areas nominated in July 2019 are ready for auction after the approval on 21 July 2020, four more sea areas were nominated as promising areas in the same month.

In March, GWEC and the Japan Wind Power Association (JWPA) set up a new Japan Offshore Wind Taskforce (JOWTF), which will play a key role in working with the government to develop a sustainable wind industry, as well as produce a detailed Cost Reduction Study to identify different price/volume scenarios and investment and industrialisation opportunities.

The feed-in tariff (FiT) for wind power was approved in Japan in 2012, but the tailor-made offshore FiT was not available until March 2014, when the Ministry of Economy, Trade and Industry (METI) approved the ¥36/kWh (€0.28/kWh) FiT for offshore wind. Despite the rate being the highest available anywhere in the world for offshore wind, Japan only had 66 MW of offshore wind installed by the end of 2019, including five floating turbines (totaling 19MW) and 23 near-shore wind turbines.

The slow uptake is attributed to Japan’s overly complex Environment Impact Assessment (EIA) system and market uncertainty. It can take four to five years to pass through Japan’s strict environmental assessment process, and the lack of clarity and coordination between different government bodies has prompted industry to call for a “one-stop shop” approach. As of January, 14.8 GW of offshore wind projects were recorded in the EIA pipeline.

To address these challenges, the government has been streamlining regulation since 2017. Further progress was made in 2019 with METI and MLIT announcing the first nomination of 11 offshore wind promotion zones in July for fiscal year (FY) 2019. Four of these zones (Goto in Nagasaki, Choshi in Chiba, Yurihonjo in Akita, Noshiro in Akita) have been nominated as promising areas where local authorities and residents have agreed to cooperate to develop offshore wind projects.

Although COVID-19 prolonged public consultations, METI and MLIT launched Japan’s first auction in July for a floating offshore wind farm (8 turbines, not less than 16.8 MW) off Goto City in Nagasaki Prefecture, to run until December 2020.

According to METI, the operator will be selected in June 2021. The other three promising areas nominated for FY2019, were nominated as the zones for promotion of offshore wind on 21 July 2020. Of these areas, the Yurihonjo area in Akita has been divided into two areas, Yurihonjo North and Yurihonjo South, to promote competition.

Furthermore, METI & MLIT announced the second nomination of 10 offshore wind promotion zones in July 2020 for FY2020. Four of these zones (Aomori Japan Seaside North, Aomori Japan Seaside North South, Happou and Noshiro in Akita, Saikai in Nagasaki) have been newly nominated as particularly promising areas.

Offshore wind in Japan’s long-term energy strategy Japan has hesitated to announce a long-term offshore wind
ANALYSIS: OFFSHORE WIND

Candidate offshore wind promotion areas in Japan

Source: METI, MLIT, JWPA

Momentum for offshore wind in South Korea is picking up at the start of a new decade.

As of June, there are currently five operational offshore wind projects (Mitsubishi Heavy Industries and Vestas), SGRE, GE Renewable Energy, and others to move in. This year is expected to be an important year for Japan’s offshore wind sector, with the launch of the first wave of commercial projects and the announcement of the framework for further tenders.

South Korea

Nearly a decade ago, South Korea adopted an ambitious Green Growth Strategy that aimed to reduce greenhouse gas emissions by 30% by 2020. This strategy marked the beginning of “green growth” as the direction of travel for South Korea’s economic growth, sparking the interest of domestic industrial conglomerates (such as Samsung, Hyundai, Doosan and STX) in renewable energy project development and equipment supply.

Following a 2.0 MW STX direct drive offshore turbine and a 3.0 MW Doosan geared drive turbine installed in early 2010s for testing purposes, the 30.0 MW Tamra offshore wind farm came online off Jeongdeung-ri in Jeju Island in 2016. However, the sector has been generally slow to take off, due to public opposition on environmental and livelihood (fishing) issues. Long permitting periods and a low initial feed-in tariff, prior to the introduction of the Renewable Portfolio Standard scheme, also dampened growth.

As a result, South Korea’s initial foray into “green growth” and a clean energy transition saw little translation into action for the better part of the last decade. South Korea prepares to push the reset button on offshore wind.

Nonetheless, at the start of a new decade, the momentum for offshore wind in South Korea is picking up with the passage of President Moon Jae-in’s Green New Deal and a groundswell of interest from ambitious consortia of local and international wind energy developers. As of June, there are currently five operational offshore wind projects totalling 132.5 MW, including the latest and largest 60MW demonstration Southwest Offshore Wind Project completed in January – the first phase of a massive 2.5 GW project. Over 23 offshore wind projects are in preliminary development, totalling 7.3 GW.

Despite its slow start, South Korea’s offshore wind sector is now benefiting from the financial clout coming from both state-owned and foreign investors, and even further buoyed by its existing industrial infrastructure.

GWEC Market Intelligence forecasts that a total of 7.8 GW of offshore wind is likely to be built in South Korea by 2030, of which 1.2 GW is expected to be floating wind. However, South Korea remains a challenging market with respect to terrain complexity, turbulent wind conditions and strong incumbent energy and marine industry actors.

Coupled with criticism that government rhetoric does not always match action, the market will need steadfast public steering and ambitious long-term targets to drive decarbonisation and diversify the power mix. Still, with sufficient government commitment and industry experience from neighbouring countries to smooth the learning curve, the future of South Korea’s offshore wind sector looks bright.

Vietnam

Since commissioning its first 16MW intertidal wind farm in Bach Lieu in 2013, Vietnam has emerged as the offshore wind market to watch in South East Asia. Now with 99MW of offshore wind installed capacity, and 200MW due to come online in 2020, Vietnam has drawn significant interest amongst international developers, investors, and financiers as a rapidly growing market for wind.

Vietnam’s market growth is supported by strong fundamentals including a steep rise in energy demand, rapid industrialisation and a growing population. While currently dependent on fossil fuel generation, the Vietnamese government has sought to accelerate the production of electricity from renewable sources, targeting 10% renewables in its 2030 power mix in PDP 7, the country’s master energy plan.

Steady strengthening of Vietnam’s wind project pipeline PDP 7 aims for 800MW of onshore and offshore wind energy by 2020 and 6GW by 2030 – which pales in comparison with the country’s technical potential. With a coastline of more than 3,300 kilometres and average wind speeds of 8-9m/s in the south, up to 475 GW of fixed and floating offshore wind resource potential has been identified by the World Bank Group.

Due to growing industry appetite to develop offshore wind power in Vietnam, the market is expected to reach around 2.0
GW of offshore wind capacity by 2025 and 5.2 GW by 2030. Offshore wind is prioritised in the government’s plan to build a “blue economy” – developing marine-based renewables to meet energy needs – and achieve energy security.

Since revising PDP 7 in 2016, the Vietnam government has been reorienting its reliance on coal to prioritise clean energy sources.

Whilst Vietnam remains a net coal importer for now, the declining economics of new coal generation vis-à-vis wind and solar power are driving the shift to utility-scale renewable generation. Despite the ambition for decarbonisation and attractive resource potential, pursuing a least-cost transformation of the energy system will require transparent policy, streamlined administration and a flexible grid. The lack of policy differentiation between onshore, nearshore and large-scale offshore wind projects of Vietnam is holding the sector back.

PDP 8 is expected to deliver more concrete policy frameworks for large-scale offshore wind developments, including zoning, marine spatial planning, and ports infrastructures plans and permitting processes. A key issue will be the design challenges for grid upgrades, and whether public or private bodies will be responsible for making investments in grid connections and broader transmission infrastructure.

Promising developments for PDP 8, expected by the end of 2020, will outline a two-year extension to the current FiT framework for offshore wind, as well as higher capacity targets out to 2030. In April, the Ministry of Industry and Trade of Vietnam (MOIT) officially proposed an extension of the FiT mechanism for wind projects from 1 November 2021 to 31 December 2023. By 2024, the government is planning to transition wind procurement to an auction system.

This development followed policy engagement with GWEC Asia, which highlighted the supply chain disruptions, labour shortages and construction delays brought by the Covid-19 outbreak, as well as the permitting delays to several wind projects which made it infeasible to meet the 2021 commissioning deadline under the original FiT framework.

A direct power purchase agreement (DPPA) pilot programme could also generate new revenue opportunities and demand for renewable energy from industrial consumers. Currently, national utility Vietnam Electricity (EVN) and its subsidiaries act as the sole off-taker of electricity from generators. However, the government has announced its vision for a competitive power market, with this DPPA pilot scheme operating from 2021 to 2023, paving the way for a retail electricity market.

Offshore wind is set to play a critical role in Vietnam’s clean energy transformation, bringing in local and foreign investment, creating local and sustainable jobs, delivering carbon reduction and positioning the country as an energy leader in South East Asia.

**Offshore wind: A decade of steep growth ahead**

The COVID-19 pandemic has shocked the global energy sector, forcing projects to suspend work to comply with social distancing regulations, challenging the investment conditions of markets bracing for economic recession, and slashing power demand by up to 10% in some regions in 2020. The size of that decline is around seven times greater than during the 2008-2009 global financial crisis, according to the IEA, and has hit demand for oil, natural gas and coal the hardest.

But renewable energy will see an overall increase in its share of global power generation this year, due to its cost-competitiveness and priority dispatch in many markets. And the offshore wind sector, with longer project development timelines, will largely be shielded from the short-term supply chain disruptions which impacted project execution in onshore markets across the world.

In 2020, the wind capacity lost to the pandemic is estimated by GWEC Market Intelligence at around 15 GW, with volume shifting to come online by 2021 instead.

Over the next five years, the leader for offshore wind installations by far will be Mainland China. Driven by an offshore wind FIT for projects which will be grid-connected by 2021, the market has sufficient runway and production capacity to rebound from the slowdown in activity during H1. The delay for offshore wind project construction in China is estimated at six months, due in part to restrictions on imported bearing materials from Europe and imported blade materials.

Since the grid-connection deadline extension proposal sent by the local wind industry to the National Energy Administration (NEA) seems unlikely to be approved at the time of writing, the Chinese offshore industry is currently running in full steam in project construction. Based on the latest offshore wind market dynamics and feedback from suppliers and developers in China, GWEC has kept its 19 GW pre-COVID forecast unchanged for China for at least the next five years.

GWEC Market Intelligence forecasts more than 6 GW installed in markets like South Korea, Japan, France, Norway and the UK. Turbine technology is another area to watch, with European and Chinese OEMs improving capacity and resilience to achieve LCOE reductions and application in a wider range of marine environments. The average size of installed turbines is on track to be 10-12MW by 2025. As hydrogen costs fall and cross-industry collaboration takes place, Power-to-X offers a potential solution to allow offshore wind to scale exponentially and support the decarbonisation of fossil fuel-dependent sectors.

However, these require adequate policy coordination and supportive frameworks, a formula which allowed renewables to take off over the last decade. As summarised in this report, there are already plenty of lessons to be gleaned from early offshore wind markets regarding support schemes, grid integration, cost reduction and industrial development. There are still areas for R&D and investment, with GWEC and industry players continuing to scan the horizon for opportunities to innovate, learn and improve offshore wind in order to accelerate its deployment. Combined with collaboration with the government, the industry can build on these to deliver offshore wind’s potential as a core pillar of the global energy transition.