Taking offshore wind global

Ben Backwell, CEO GWEC
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GWEC’s Mission

1. To act as an authoritative voice for the global industry, speaking out on policy issues that affect the industry, fostering best practices and technology innovation and ensuring fair market access and fair treatment for its members across global markets.

2. To develop new markets for the wind industry and accelerate the global growth of the sector. GWEC has a successful track record in places like China, India, Brazil, South Africa, Mexico, Argentina and Colombia. We are currently helping to develop crucial emerging markets such as Vietnam and the Philippines, while working to accelerate growth in others such as India and Mexico, and enable the expansion of Offshore Wind into global markets.
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C1, C2, and C3 Members

[Image of logos and company names]
Global Offshore Wind Market

- Potential, Dynamics, Outlook
Global offshore wind potential

- 3.1 terawatts is technically available in selected emerging markets
Characteristics of the offshore wind market

Large, complex projects
Offshore projects have a minimum size of 100MW+, normal project size is now more like 300 MW to 1.2 GW

Capital-intensive projects
For a 500MW wind farm, it takes 50mn USD to develop and 2bn USD to build

Long development time
It takes 7 to 10 years from gaining the option to the full commissioning of the wind farm, emerging markets take longer

Strong reliance on political support
Long-term political support including targets and to drive legislative and administrative change

“No easy way to enter the offshore wind industry”

Experience gained in mature markets over the past 15 to 20 years

Projects are now on time and on budget, providing stable revenue stream

Offshore wind has become attractive for institutional investors, now even entering at pre-construction stage

Source: GWEC Market Intelligence, expert interview
Market-based mechanisms dominate the global wind market

Support scheme and capacity allocation mechanism
Status Jan 2020

- Technology-specific auctions and tenders (“Wind only”) dominate to allocate offshore capacity

Global wind auction results 2015-2019

- Onshore
- Offshore

- 2015: 6,471
- 2016: 5,426
- 2017: 12,585
- 2018: 15,718
- 2019: 34,047

Source: GWEC Intelligence, National sources, January 2020
LCOE and bid levels

Mature offshore wind markets

Germany
LCOE - 78-138 USD/MWh
Bid - 50 USD/MWh (2018)

UK
LCOE - 69-93 USD/MWh
Bid - 50 USD/MWh (2019)

Developing offshore wind markets

USA
LCOE - 62-121 USD/MWh
Bid - 100USD/MWh PPA

China
LCOE - 82-115 USD/MWh
FIT - 110-125 USD/MWh
Bid – 102 USD/MWh (2019)

Vietnam
• n. a.
• 98 USD/MWh (FIT)

In 2017, 1.38 GW of offshore wind out of its first German competitive auction totalling 1.49 GW won the tender with a zero-subsidy, then followed by the Netherlands in 2018. Zero-subsidy bids mean the projects will only receive the wholesale electricity price, which introduces merchant risk.

Different LCOE and bid levels in mature and developing offshore markets underline different risk profiles.

Source: GWEC Market Intelligence Auction Database August 2019, BloombergNEF LCOE Update H2 2019, Lazard’s LCOE Analysis (US market), AWEA
Innovation and efficiency are key growth drivers (Turbine)

- Capacity factors continue to improve
  FX. GE Haliade-X 12 MW DD turbine claims 63% capacity factor, 5-7 points above the industry standard.

- Increase of AEP
  FX. SGRE SG10.0-193 DD turbine will have up to 30% AEP increase compared with SG8.0-167DD. GE Haliade-X 12 MW DD turbine AEP is likely to be twice as much as the Haliade 150-6MW

- Cost reduction of BOP
  FX. Less unit means saving for foundations, inter-array cable, installation for foundation, turbine and cable.

- Reduction of OPEX
  O&M costs account for approximately 25-30% of total project life-cycle costs. Less unit also means saving in Project OPEX

Source: GWEC Market Intelligence, WindEurope, BNEF
Innovation and efficiency are key growth drivers (Turbine)

- Where the offshore turbines is headed: rated capacity of 20 MW (with rotor larger than 260m) by 2030;
- Floating challenge: too many designer (15+), needs consolidation and needs to be modularized.

Source: GWEC Market Intelligence, BTM Consult, April 2019
According to GWEC Market Intelligence’s forecast, 185 GW of offshore wind is likely to be built between 2020 and 2030, bringing the global total to about 215 GW, of which 96 GW (45%) located in Europe, 89 GW (42%) in Asia, 25 GW (12%) in North America.

China is expected to install 52 GW new offshore wind in 2020-2030, making it the largest offshore wind market in the world in both new and accumulative installation.
Floating offshore wind outlook 2030 - up to 19GW

- The world’s first floating turbine, SWT-2.3MW, was installed by Equinor in Norway in 2009.
- As the end of 2019, 80.5 MW of floating wind were installed in ten countries with the UK taking the lead followed by Portugal and Japan.
- 1,308 MW planned to be built by 2026, of which 82% is located in Europe and the rest in APAC.
- 2030 floating forecasts spread from 6GW up to almost 19GW, all influenced by how quickly levelled cost of energy numbers can be brought down to below €50/MWh ($55/MWh).
- Floating wind will be considered as simply another choice of foundation solution rather than as a separated offshore wind sector, 100-150 GW is projected to be built in EU by 2050.

* CAGR = Compound Annual Growth Rate
Source: GWEC Market Intelligence, January 2020

- The next large scale floating project, Hywind Tampen, will be installed 140 km off the coast in the water depth of 260-300m.

Global floating offshore wind outlook based on announced project pipeline, 2020-2026

CAGR* 58.3%

The UK Portugal Norway France Spain Greece Japan South Korea China The US

MW

0 50 100 150 200 250 300 350 400 450 500

2019 accu. 2020e 2021e 2022e 2023e 2024e 2025e 2026e
European offshore wind vision for 2050

- **450 GW by 2050 vision**: 380 GW in the North Seas and 70 GW in Southern European waters;
- The 2050 vision is not only to help Europe go carbon-neutral and keep the technology leadership, but also to bring huge opportunities for economic growth, industrial restructuring (O&G) and job creation (local industry and supply chain);
- To reach the 450 GW target, annual installation rates need to increase from today's 3 GW per year to over 20 GW per year in 2030;

Japan’s offshore wind potential
Japan’s offshore wind potential

As of December 2019, Japan has 65.6MW of offshore wind power, including five floating turbines totaling 19MW, with another 13 GW of projects under EIA process.

GWEC Market Intelligence forecasts that the country could boast 10GW of offshore wind capacity by 2030 if effective industry development is achieved.
Accelerating Japan’s offshore wind market

- Europe took over 20 years to establish its offshore wind market
  - 1991, first offshore wind farm, 450kW turbines
  - Early 2000’s, 2MW marinised onshore turbines
  - Now, 12MW turbines, designed specifically for offshore wind with high performance and reliability
  - A similar evolution for foundations, transmission, construction vessels, project management, health and safety, de-risked financing, etc.

- Japan can harness this global momentum to rapidly create its own offshore wind market
  - Learning from experience from other markets
  - Adapting it to Japan’s political and fiscal backdrop
Japan Offshore Wind Task Force

Launched by GWEC and JWPA on 27 February 2020 with key local and global industry players to accelerate Japan’s offshore wind market.

The Task Force will address key bottlenecks to the growth of Japan’s offshore wind industry such as providing input to streamline the regulatory process for project development and building a local supply chain.

The first deliverable of the Task Force will be a cost reduction study to explore the long-term cost reduction potential of the industry in Japan. The study will be released in October 2020 at the Global Offshore Wind Summit – Japan, organised jointly by GWEC and JWPA.
Thank you!

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