



HOW THE US CAN LEARN LESSONS FROM THE EUROPEAN WIND INDUSTRY

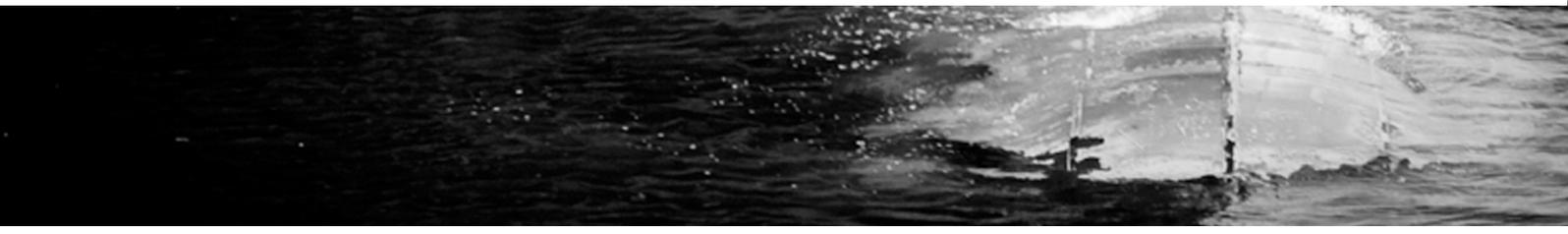
Colebrook Offshore Ltd

How the US can learn lessons from the European Wind Industry

By all accounts, the US offshore wind market is set to boom over the coming years. The success of onshore wind installations has smoothed the road domestically for the advent of offshore. The generation of local jobs, cheaper and cleaner energy and the potential for the growth of local economy is appealing at both a federal and state level. Several states, most notably Massachusetts and New York but with several others following closely behind, are writing into law their road maps for wind generated energy quotas and funding. In Massachusetts, the Act to Promote Energy Diversity signed in August 2016 allows for the procurement of up to 1600mW of offshore wind energy by 2027. Complementary projects like the New Bedford Marine Commerce Terminal offer offshore support capability and new projects are also being green-lit. Most recently Vineyard Wind, a joint venture between Avangrid Renewables and Copenhagen Infrastructure Partners, won the bid to propose a wind farm off the coast of Martha's Vineyard. The New York State Offshore Wind Master Plan published in January 2018 demonstrates a commitment to build scale and reduce costs, with a target of 2,400 mW being generated by 2030.

However, this is a new industry for the US. In the early days of the offshore oil and gas industry the US led the way. It supported the infant industry of offshore drilling and exploration in Europe, particularly the North Sea. Conversely, Europe is leading the wind sector and sharing the benefits of 25 years of harsh environment offshore operations and trial and error. The burgeoning growth in the US is being driven and bolstered by funding structures and expertise from the UK, Denmark, Holland, France, Germany and others. There is huge potential to capture wind energy on the North East coast of the US, and the pioneers are well placed to benefit from the lessons learned in Europe and to avoid the pitfalls that may lurk beneath the waves.

In the early days of renewable energy, European OSVs and PSVs were recruited from the oil and gas sector to be pressed into service installing and maintaining wind farms. The US could replicate this, but the current resurgence of oil and gas may mean that prices and availability are prohibitive. However, the oil and gas sector in the US is extremely experienced and infrastructure is in place across the Gulf of Mexico to support a fragile and growing renewables sector. Shipowners like Edison Chouest and Tidewater have been recalling their fleet from less buoyant deep-water drilling zones such as West Africa, bolstering the domestic fleet in the Gulf, ready to respond to chartering opportunities. In the North Sea, companies such as Blue Star and AI are buying up older tonnage specifically to create a corral of vessels for the wind sector. It may be that US companies follow the same path, although fixing less modern vessels could create problems of marine standards compliance as the aging fleet is outstripped by changing requirements.



How the US can learn lessons from the European Wind Industry

As the technological side of the industry developed in Europe, so did the specialisation of vessels, and now purpose built SOVs service the farms put in place by state of the art WTIVs. According to Sven Utermohlen, the COO of E.ON, the US will be able to skip the 'painful stage' of vessel utilisation, take advantage of the technological advances and go directly to building wind specific, fit for purpose vessels, although of course this has a significant cost and time implication.

Wind farms are usually made up of monopile structures supporting the turbines, embedded in the sea floor. In US coastal waters, they are therefore regarded as a US port on US soil. According to the Jones Act 1920, vessels moving between two ports in the US must be compliant - US owned, US built and US flagged. This raises an issue with sharing equipment from Europe, although the installation on Block Island which began producing in December 2016 did use European vessels. That being said, it is to be assumed that States will want to develop their own equipment and increase work volumes through their own shipyards. Suggestions from the New York State Energy Research and Development Authority (NYSERDA) in their report of October 2017 (see footnote 3) are that companies invest in feeder barges that would allow Jones Act non-compliant vessels to link to port. Estimates from shipyards put the cost of commissioning a feeder barge of this type at around \$87 million and predict that two feeder barges on constant rotation will have paid for themselves in 10 years. The other suggestion is to commission a Jones Act-compliant WTIV, which they estimate at around \$222 million, paying for itself in 23 years of work. These options are expensive but do have the benefit of being specially designed for the harsh environment off the Atlantic Coast and perfectly fit for purpose. They also provide jobs at US shipyards and fuel local economy, as well as developing local expertise.

The first offshore wind farm in the US, as mentioned above, is the pilot installation on Block Island (RI). The five-turbine farm was built by the Fred. Olsen Windcarrier Brave Tern, a self-elevating and self-propelling WTIV built in Dubai and with a Malta flag. The link from port to WTIV, however, was provided by vessels from Falcon Global, a subsidiary of US owner Seacor. Joint ventures with European shipowners and US based companies offer a solution where the US company provides everything except the installation vessel. This "combined Jones Act/foreign flag installation service" is certainly a strong option for the interim where US stakeholders may be waiting for delivery on a newly commissioned vessel. The Bureau of Ocean Energy Management has also commented that it would consider this option during the permit process for Vineyard Wind. Fred. Olsen's VP, Ketil Arvesen, has commented that this route would "combine the best of US marine expertise and Jones Act compliant liftboats with European offshore wind know-how and class-leading jack-up vessels". The most recent joint venture in this area, announced at the end of May 2018, between NOV Rig Technologies (TX) and GustoMSC (Netherlands) demonstrates that US and European companies are working together to create solutions specifically targeted at offshore wind.

How the US can learn lessons from the European Wind Industry

A floating turbine is another option to consider alongside the use of foreign vessels. These installations are not attached to the sea bed, although they are anchored using suction anchors and have an export cable to transmit the power which may be partly buried. It is questionable whether they would be classified as a port in the US. Hywind, the first floating offshore installation, began generating in 2018. Equinor (previously Statoil) in partnership with Masdar, set up the installation off the coast of Aberdeen, Scotland, and although the running and installation costs are initially higher than monopile or other fixed platforms, as the technologies and infrastructure develop this will level out and be competitive with other sources. The Hywind farm currently operates at depths between 95 and 125 metres. The floating option would also be suitable in the heavy swell and harsh environment of the NE coast, allowing the capture of more power in a shorter time frame further offshore, where the intensity and consistency of wind is stronger.

One area where the US is sure to benefit from European experience is that of technology - on vessels, equipment and infrastructure and storage. As mentioned above, the European market is now commissioning and building specialist, efficient vessels and technology for a variety of offshore environments - including CTVs, SOVs, bubble curtains and Walk to Work.

The increasing size of turbines and the increasing reliability of the technology used to monitor and control them has vastly reduced running and installation costs in Europe. The equivalent of \$3.8 million investment per mW of power produced in late 2016 had fallen to \$2.2 million per mW at the end of 2017. Something to consider for US investors is the optimum size of the turbines put to use. Apart from their suitability for the particular offshore environment being farmed, the appropriate capacity for them to be transported and installed is an important consideration. For example, the development by GE of the Haliade-X, a 12mW turbine with a 220 metre rotor diameter and 38,000m² swept area has been hailed as highly powerful and efficient, but the difficulties of installation may outweigh its benefits in terms of capital investment.

25 years of experience in Europe has also generated significant benefits in terms of falling costs. The maturity of the industry - expertise in supply chain, the increasing size of wind farms and asset portfolios - and subsequent increase in investor confidence has opened the door to zero subsidy projects which in turn move the European market towards independence. Issues that have caused problems for the European wind industry may be avoided in the US. Some areas of the grid and storage infrastructure haven't expanded quickly enough to soak up surplus energy. This has created bottlenecks, especially in Germany and mainland Europe, where the market has moved from adding turbines to bidding for limited grid capacity. Problems thrown up by local public opposition to new power lines (for example) is also challenging the industry to come up with new and innovative ways to utilise the energy being generated offshore. This is already being addressed in the US with ambitious supply chain and grid projects being proposed alongside installation bids. The early conflict between renewables and oil and gas companies also seems to be on the wane, as companies built on fossil fuels now embrace the opportunities of offshore wind and use their considerable expertise to break into this new and potentially lucrative market.



How the US can learn lessons from the European Wind Industry

The excitement surrounding offshore wind energy generation off the US coastline is palpable. Investors from the US and Europe will have to negotiate the strict legislation surrounding the US market and it seems that a holistic approach, offering solutions for infrastructure alongside support from private investors and utilities companies will be the most successful. The rejection of Energy Secretary Perry's proposal to subsidise struggling coal and nuclear plants indicates that the Trump administration is, for the moment, harbouring a favourable attitude towards the generation of offshore wind energy, and there will be a rush to make the most of this beneficence. More explicit federal government support in the form of funding is yet to be announced and the future is still unclear. It is clear, however, that US and European stakeholders are preparing themselves to join the competition for bids and permits in many US coastal States, and opportunities will surely be made by those with a creative solution and a balanced eye on the long and short term.

References

¹ <https://e360.yale.edu/features/after-an-uncertain-start-u-s-offshore-wind-is-powering-up>

² <https://www.offshorewind.biz/2018/05/08/why-the-us-offshore-wind-market-is-going-to-be-even-bigger-than-you-think/>

³ U.S. Jones Act Compliant Offshore Wind Turbine Installation Vessel Study NYSERDA Report 17-13 (October 2017) A Report for the Roadmap Project for Multi-State Cooperation on Offshore Wind

⁴ Merchant Marine Act of 1920, Section 27 (Jones Act) deals with cabotage and requires that all goods transported by water between US ports be carried on US-flag ships, constructed in the United States, owned by US citizens, and crewed by US citizens and US permanent residents.

⁵ <http://dwwind.com/press/block-island-wind-farm-installation-vessel-completes-transatlantic-journey-arriving-weekend-rhode-island/>

⁶ https://www.maritime-executive.com/article/seacor-and-fred-olsen-team-up-for-u-s-wind-farm-construction#gs.Yb0_lpk

⁷ <https://www.equinor.com/en/what-we-do/hywind-where-the-wind-takes-us.html>,
<https://www.offshorewind.biz/2018/02/15/worlds-first-floating-wind-farm-outdelivers/>

⁸ <https://e360.yale.edu/features/after-an-uncertain-start-u-s-offshore-wind-is-powering-up>

⁹ <https://www.nytimes.com/2018/01/08/climate/trump-coal-nuclear.html>





COLEBROOK OFFSHORE

Suite 56, Unit 5
Stansted Courtyard
Takeley CM22 6PU
United Kingdom

Tel: +44 1376 440 281
chartering@colebrookoffshore.com
www.colebrookoffshore.com

