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Commentary

Unfavourable Gusts: Cost Inflation Distressing Offshore Wind Projects, Earnings, and Credit Quality

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Key Highlights

- The strong growth realized in recent years by the offshore wind power industry is being challenged by significant cost inflation.
- The increase in industry costs would meaningfully reduce project returns and result in lower-than-anticipated future cash flows.
- The industry is likely to receive some form of support from the governments promoting these projects because of the importance of offshore wind power in enabling policymakers to achieve their decarbonization plans.

Kevin L. Beicke, CFA
Vice President, Project Finance and Infrastructure
+1 646 870-1832
kevin.beicke@dbrsmorningstar.com

Arthi Sambasivan
Managing Director, Project Finance, Infrastructure and Sports
+1 416 597-7438
arthi.sambasivan@dbrsmorningstar.com

Cost Inflation Challenges

The strong growth realized in recent years by the offshore wind power industry is being challenged by significant cost increases. The current global economic environment, suffering from relatively high inflation and supply chain disruptions, has led to meaningful cost escalations for many industries, including offshore wind. Such large cost increases resulting from global macroeconomic shocks are difficult to forecast, especially so for offshore wind power projects, which could take nearly a decade to complete given the lengthy process for development, design, and construction.

Swedish energy company Vattenfall AB (not rated by DBRS Morningstar) announced July 20, 2023, that it would stop development of its British Norfolk Boreas offshore wind power project as a result of rising costs, and it suggested that other companies' U.K. offshore wind power projects may face similar problems. The 1.4 gigawatt (GW) Norfolk Boreas project was expected to start producing electricity in the late 2020s and was part of Britain's plan to increase its offshore wind power capacity to 50GW by 2030 from approximately 14GW now. Vattenfall claims overall project costs increased around 40% since the auction that was held last year, and today's market conditions would require an electricity price far greater than what is included in the Contracts for Difference (CfD) price.

We view the Norfolk Boreas project announcement as potentially credit negative for Vattenfall, not only because of the SEK 5.5 billion hit to earnings, but also because of what the market conditions mean for Vattenfall's business and its other offshore wind projects under development. The increase in industry costs could meaningfully reduce project returns and result in lower-than-anticipated future cash flows.

Likewise, we view the industry cost inflation as a near-term credit negative for the industry as a whole. Unless offshore wind developers can renegotiate electricity prices for projects currently under development or receive additional tax credits to compensate them for these significant project cost increases, the credit quality of these project owners is likely to weaken.

We believe it is likely that the industry will receive some form of support from the governments promoting these projects because of the importance of offshore wind power in enabling policymakers to achieve their decarbonization plans. Offshore wind farms, although more expensive to build, are more efficient than onshore wind farms because of their higher wind speeds, greater consistency of the wind, and lack of interference from topographical features. Another positive aspect of offshore wind farms is that they can be built relatively near high-population-density coastal urban areas, which lack the open

land needed for large onshore wind or solar power farms. We expect offshore wind power to remain a vital source of renewable energy going forward and for capacity to continue to increase in coming years.

DBRS Morningstar's high-level criteria for rating project finance structured offshore wind projects can be found in its *Global Methodology for Rating Wind Power Projects*.

A History of the Industry

A Pilot Project in Denmark

The offshore wind power industry has grown significantly over the past decade, making technological leaps since the first offshore wind farm, Vindeby, was commissioned by Danish energy company Orsted A/S (not rated by DBRS Morningstar) in Denmark in 1991. Vindeby consisted of 11 turbines totaling 5 megawatts (MW)—approximately 0.4MW per turbine—and was capable of powering the annual consumption needs of approximately 2,200 Danish households. Vindeby proved that offshore wind could be harnessed to provide the power needs for customers onshore. However, the technology employed at Vindeby and with other similar pilot projects in the 1990s was relatively simple, consisting of onshore-sized turbines built close to shore in shallow water on concrete foundations.

Utility-Scale

The first true utility-scale offshore wind farm, Horns Rev 1, was built by Danish energy company Elsam, which was later acquired by Orsted, and was commissioned in the North Sea west of Denmark in 2002. Horns Rev 1 was a technological leap at the time, the first offshore wind farm to use steel monopile foundations 18 kilometers (km) from the shore and to have its own dedicated offshore substation. It was a 160MW wind farm consisting of 80 2MW turbines.

Growth in Northern Europe

In the 2000s European politicians increased their focus on offshore wind power as part of their efforts to combat climate change. The UK became the leading offshore wind market following the first of three large seabed leasing rounds: the first was in 2000 for 1,100MW to be installed over 11 projects, the second in 2003 for 7,200MW over 15 projects, and the third in 2008 for nine development zones for up to 32,000MW. Other European countries grew capacity as well. Offshore wind projects grew in size and complexity, moved farther offshore, and had turbine sizes increase to 3.6MW from 2.3MW. Specialized boats and helicopters became necessary during construction, and the costs of these projects increased dramatically.

Driving Down Costs

Developers and industrial suppliers worked together to share their expertise, develop a firm supply chain, make technological and design improvements, and decrease costs. In 2012, Orsted proposed a plan to reduce costs to EUR 100/MWh by 2020, with the UK setting a target of GBP 100/MWh by 2020. Best practices were adopted industrywide, resulting in efficiencies and cost reductions. New design models were created in 2016, enabling foundations to use less steel. Turbine manufacturers worked with developers to increase the size of the turbines to 8MW for projects commissioned as early as 2017

and then 12MW for projects commissioned in 2021, resulting in the need for fewer towers and fewer turbines to achieve the same overall size of a project.

Electricity market reforms were implemented in Europe, increasing competition and reducing electricity prices. The UK introduced the CfD pricing mechanism in 2013, which uses competitive auction rounds to lower costs while creating a guaranteed electricity price for developers. Similar auction-type pricing plans were held in 2015–17 in the Netherlands, Denmark, and Germany.

The first zero-subsidy offshore wind energy contracts were awarded in 2017 in Germany and the Netherlands, demonstrating the successful industry efforts to drive down costs. In September 2017, the 1,386MW Hornsea Project 2 was awarded a CfD of GBP 57.5/MWh, significantly lower than the 2020 target of GBP 100/MWh.

Growth Around the World

Before 2018, the offshore wind power industry was largely located in northwestern Europe and China. These regions have demonstrated that offshore wind can be an effective and reliable power source that could be competitively priced compared with other energy resources. This proven technology, along with the desire of many governments to expand renewable energy to help reduce carbon emissions, has led to the recent expansion of the industry around the world, particularly in the U.S., India, Japan, South Korea, and Taiwan.

Offshore Wind Comes to the U.S.

Block Island

The 30MW Block Island Wind Farm was commissioned in 2016 by Deepwater Wind, which was later acquired by Orsted. The wind farm consists of five 6MW turbines and provides 100% of Block Island's power consumption, with the rest of the wind farm's output exported to the mainland Rhode Island. Block Island Wind Farm is America's first offshore wind farm.

U.S.-European Partnerships

In the U.S., offshore wind power projects have primarily employed a joint-venture ownership structure, partnering a local electric utility company with a European offshore wind developer. These partnerships have enabled projects to benefit from each partner's area of expertise: the local utility company with transmission and relationships with local stakeholders; and the developer's experience with the development, construction, and operating and maintenance of the project. Partnerships also have helped ease the cost burden for these multibillion dollar, multiyear projects.

Vineyard Wind 1

The 800MW Vineyard Wind 1 project will be the first commercial-scale offshore wind power project once completed, which is expected before year-end 2023. The project is ultimately jointly owned by Avangrid Renewables, LLC (not rated by DBRS Morningstar; a subsidiary of U.S. utility holding company AVANGRID, Inc.) and Copenhagen Infrastructure Partners K/S (not rated by DBRS Morningstar; a Dutch

fund management company). It will consist of 62 13MW turbines located 35 miles south of mainland Massachusetts and 15 miles south of Martha's Vineyard.

South Fork Wind

The 132MW South Fork Wind project is expected to be operational before year-end 2023. The project is ultimately jointly owned by U.S. utility holding company Eversource Energy (not rated by DBRS Morningstar) and Orsted. It will consist of 12 13MW turbines located 35 miles east of Montauk Point (Long Island), New York.

Other U.S. Projects Under Development

Several offshore wind projects are under development in the Atlantic Ocean off the coast of the U.S., including the following, which are expected to be completed in 2025:

- Ocean Wind 1: A 1,100MW wind farm located 15 miles east of southern New Jersey owned by Orsted.
- Sunrise Wind: An 880MW wind farm located 30 miles east of Montauk Point (Long Island), New York, jointly owned by Orsted and Eversource.
- Revolution Wind: A 700MW wind farm located 15 miles south of Rhode Island jointly owned by Orsted and Eversource.
- MarWin: A 300MW wind farm located 20 miles east of Maryland owned by US Wind, which is majority-owned by Italian developer Renexia SpA (not rated by DBRS Morningstar).

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