

Application for operational lifetime extension

Horns Rev 1 Offshore Wind Farm
October 2025

Confidentiality class: C1 – Public

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1. The application

1.1. Introduction

Vattenfall and Ørsted the joint venture partners of the Horns Rev 1 Offshore Wind Farm (JV) hereby submit an updated permit application to extend the operational lifetime of Horns Rev 1 Offshore Wind Farm in the eastern North Sea (Wind Farm) cf. para. 29 of The Danish Renewable Energy Act.

The current production license issued by the Danish Energy Agency (DEA) on July 25, 2002, is due to expire on July 25, 2027. The JV wishes to continue operation of the Wind Farm for an additional 15 years, i.e. until 2042.

The application refers to an operational lifetime extension of the Wind Farm that involves continued operation with no changes in the Wind Farm set-up or works needed, apart from regular maintenance.

1.2. Updated application

Since the application in April 2025 Vattenfall has performed several updates to the background documents of the application required for the lifetime extension to comply with Danish regulation and the guideline.

Vattenfall has performed an appropriate Natura 2000 assessment on displacement and cumulative effects in accordance with Article 6 of the Habitats Directive (92/43/EEC). Expert scientific advice has been sought from DCE. A memo containing the advice from DCE can be found on DCE's website. The advices received have been considered in the assessment.

Vattenfall has also updated the Residual Lifetime Assessment based on the comments delivered by the DEA.

Furthermore Vattenfall has gathered bat data for spring and early summer of 2025, which supplements to data already collected in 2024. See appendix 3 for the results. Data for the last part of the 2025 season is expected to be collected from the turbines in late October and thereafter analysed.

1.3. The Wind Farm

The Wind Farm was built as the first large-scale offshore wind farm in the world. Its capacity of 160 MW was four times that of the largest offshore wind farm constructed up until then. The Wind Farm was established as a pilot project to demonstrate conditions regarding installations and operations of a large-scale offshore wind farm. Furthermore, it was the first offshore wind farm in the North Sea, the first to use the monopile foundation type and the first to have its transformer on an adjacent offshore platform rather than onshore. Technologies used for the first time at the Wind Farm have since become industry standard.

The Wind Farm, located in the North Sea approximately 14 - 20 km from the Danish west coast, consist of 80 Vestas V80 WTG, each generating 2 MW. The WTG were installed and commissioned in 2002. Each WTG is installed on a steel tower, which is connected to a steel monopile structure embedded into the seabed. The WTG are set up in a grid pattern (10 x 8 strings), which is shown in Figure 1.



Figure 1. Location of the Wind Farm and the export cable which connects the substation to the onshore transmission grid.

The distance between the individual WTG is approximately 560 meter. The WTG are interconnected via a 36 kV cable network. In the north-east corner of the Wind Farm, there is an offshore substation, Horns Rev Alpha, where the 36 kV cables come together. The substation is owned and operated by the TSO, Energinet. The substation is also connected via a 150 kV export cable to the overall power grid at shore.

Currently, 79 of the 80 WTG are in operation (WTG87 was badly damaged by a fire in November 22, 2024¹). The JV intends to reinstall a refurbished V80 WTG (nacelle with blades) in conjunction with a granted operational lifetime extension and an extended grid connection agreement.

The WTG dimensions are specified in Table 1.

Table 1. WTG dimensions.

Parameter	Dimension
Total height	110 m
Hub height	70 m
Rotor diameter	80 m

1.4. Existing permits and licenses

The Danish Energy Agency approved the construction of the Wind Farm by granting a construction permit on March 29, 2001.

On July 25, 2002, the Danish Energy Agency approved the commencement of operations for the Wind Farm (as approved under the previously issued construction permit) and issued a production license for 25 years.

In relation to the operational lifetime extension for which the JV is applying, it is necessary to highlight that for an extended operational period there is no intended major deviation from how the Wind Farm is currently operated. This is also valid for the maintenance that is considered for an extended operational period for the Wind Farm.

1.5. Stakeholders

¹ The investigation into the reason for the incident is still ongoing.

In conjunction with the application for operational lifetime extension, it is also relevant to highlight that a continuation of the generation and distribution of renewable energy from the Wind Farm is essentially depending on the provision of the existing grid infrastructure, which is owned and operated by Energinet. Initial contact was made to Energinet on the subject in 2022, and discussions and negotiations on an extended grid connection agreement matching the applied extended time period are still ongoing with Energinet to ensure the continued operations of the grid infrastructure for an extended operational period. Vattenfall will keep the DEA informed on the progress on a continued basis.

2. Financial capacity

The Wind Farm is owned and operated by an unincorporated joint venture between Vattenfall Vindkraft A/S (CVR no. 31597544) and Ørsted Horns Rev I A/S (CVR no. 31164192).

As per the concluded joint venture agreement, 60% of the Wind Farm is owned by Vattenfall Vindkraft A/S while the remaining 40% is owned by Ørsted Horns Rev I A/S. Vattenfall Vindkraft A/S has the operational responsibility for the Wind Farm and is consequently named as the formal operator of the Wind Farm. The statement below thus focuses on the financial capacity of Vattenfall Vindkraft A/S.

Vattenfall Vindkraft A/S manages the part of the Vattenfall Group's activities in Denmark that relate to the production of renewable energy based on wind. Today, Vattenfall Vindkraft A/S and its subsidiaries are the largest owner and operator of offshore wind farms in Denmark and one of the largest owner and operator of onshore wind turbines in Denmark.

The majority of the company's income comes from dividend payments from the company's subsidiaries. The company finances its subsidiaries' through equity and loans.

The annual reports for Vattenfall Vindkraft A/S show stable figures for 2021-2023 (see Table 2).

Table 2. Key financial figures for Vattenfall Vindkraft A/S 2022-2024.

DKK'000	2024	2023	2022
Revenue	1,399,057	1,139,594	1,331,742
Equity	7,504,847	9,264,204	8,849,673
Solvency ratio	43,2%	49,8%	49,1%

The target for solvency ratio is 40-50%. The annual figures for the last three years show a solvency ratio that is within this span. In this context it should be noted, that the majority of the company's debt is towards the parent company Vattenfall AB.

Vattenfall AB has also provided a parent company guarantee of 2nd July 2008 as security for the financial obligations that Vattenfall Vindkraft A/S has or may incur.

Annual reports for Vattenfall Vindkraft A/S and Vattenfall Group can be downloaded from: <https://datacvr.virk.dk/enhed/virksomhed/31597544?fritekst=Vattenfall+Vindkraft+A/S&sideIndex=0&size=10>

3. Technical Capabilities

Vattenfall Group is engaged in electricity and heat production in a number of countries and possess extensive technical capabilities in constructing and operating offshore wind. In Danish waters Vattenfall operate five wind farms: Horns Rev 1 (160 MW), Horns Rev 3 (407 MW), Kriegers Flak (605 MW), Vesterhav Nord (176 MW) and Vesterhav Syd (168 MW).

Vattenfall Vindkraft A/S is certified by Bureau Veritas to service Vestas V80 and the planned service of the wind farm is performed internally by Vattenfall's own technicians. The operation is based from Vattenfall Group's wind power hub in Esbjerg, which comprises of an office, warehouse and harbour facilities, as well as a surveillance centre. No change regarding service is planned for the lifetime extension.

4. Environmental assessment

A Natura 2000-screening and annex IV species assessment has been performed by WSP. For the conclusions see Appendix 1. As a result of the conclusions on uncertainties with the cumulative and displacement effects of the lifetime extension in Appendix 1 the precautionary principle has been followed, and an appropriate Natura 2000 assessment on displacement effects and cumulative effects has been performed, according to Article 6 of the Habitats Directive (92/43/EEC). For the conclusions see Appendix 2.

5. Residual Lifetime Assessment

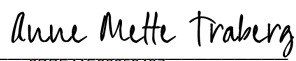
A Residual Lifetime Assessment has been performed by Tüv Süd which support a life time extension of 5 years (2032). For confirmation and conclusion see appendix 3a and 3b. A second assessment will be performed and reported well ahead of 2032 to ensure the integrity of the Wind Farm for further operation.

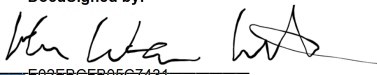
6. Concluding remarks

The JV has hereby filed an application for a permit from the Danish Energy Agency to extend the operational lifetime of the Wind Farm for an additional 15 years, i.e. until 2042 cf. para. 29 of The Danish Renewable Energy Act.

If the application for an extension of the operational lifetime of the Wind Farm cannot be accommodated, the JV anticipates that a decommissioning process needs to be initiated. The JV would hereby like to notify the Danish Energy Agency that it will require a reasonable time for preparation and planning of such a decommissioning campaign.

On behalf of Vattenfall Vindkraft A/S.

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