

# Nysted Offshore Windfarm

Application for  
Lifetime Extension and permit prolongation  
Description and Environmental Assessment

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# Content

<b>1.</b>	<b>Application about Lifetime Extension.....</b>	<b>2</b>
<b>2.</b>	<b>Background and existing infrastructures .....</b>	<b>4</b>
2.1	Ownership .....	6
2.2	Relevant stakeholders.....	6
2.3	Existing permits.....	7
<b>3.</b>	<b>Lifetime Extension, project description.....</b>	<b>7</b>
<b>4.</b>	<b>Nature 2000-screening and Annex IV species assessment.....</b>	<b>8</b>
<b>5.</b>	<b>Concluding remarks .....</b>	<b>9</b>
<b>6.</b>	<b>References .....</b>	<b>9</b>
	<b>Appendixes:.....</b>	<b>10</b>

## 1. Application about Lifetime Extension

The ownership of Nysted Offshore Windfarm (NHP) hereby requests to continue operation of the windfarm for an additional period of up to 10 years, until June 2038.

The Danish Energy Agency originally approved the establishment of NHP by granting a construction permit on 27<sup>th</sup> July 2001 to Energi E2, the original applicant. The permit was based on an Environmental Impact Assessment (EIA) submitted on 1<sup>st</sup> August 2000. The production license was granted on 10<sup>th</sup> June 2003 and subsequently replaced by the current electricity production license granted to "DONG Energy Nysted I A/S" on the 21<sup>st</sup> December 2007. DONG Energy Nysted I A/S changed its name to Nysted I A/S on 23<sup>rd</sup> October 2017.

The current production license, issued by the Danish Energy Agency on 10<sup>st</sup> June 2003, is due to expire on 10<sup>th</sup> June 2028.

To continue operations of NHP beyond 10<sup>th</sup> June 2028, a permit according to Section 29, Subsection (1), of the Renewable Energy Act is required from the Danish Energy Agency. Reference is also made to Section 25, Subsection (1), of the Renewable Energy Act.

By this application Ørsted on behalf of Nysted I A/S hereby forward an application for a permit to extend the operational lifetime of NHP. The application includes a description of the existing windfarm and operation & maintenance activities needed to extend the windfarms lifetime and a Nature 2000-screening and Annex IV species assessment according to the Habitat Directive.

As the lifetime extension of NHP does not include physical changes/deviations to the windfarm, an Environmental Impact Assessment screening and assessment according to the Marine Strategy Framework Directive 2008/56/EC and the Water Framework Directive 2000/60/EC has not been required by the Danish Energy Agency.

According to a current technical assessment NHP can stay operational until 2038, however, without warranting that it will be feasible to continue operations of the wind farm for the entire extension period.

NHP has proven its technical capability to sustain production beyond the existing permit lifetime. The reliability and efficiency of NHP have been substantiated through regular inspections, maintenance, and upgrades, establishing its feasibility for operation beyond the current expiration date.

Furthermore, the continuous generation of green electricity by NHP ensures a reliable and secure green energy supply, while awaiting the new offshore wind pipeline coming online from 2030 onwards. By extending the operational lifespan of the windfarm Denmark may effectively contribute to meeting its climate targets and enhance its energy security.

Ørsted on the behalf of Nysted I A/S believes the extension of the operational lifetime of NHP holds significant benefits for Denmark.

Here follows additional considerations about lifetime extension of existing offshore windfarms in general.

Decommissioning a well-functional windfarm after 25 years is overall an inefficient and unsustainable use of valuable raw materials and components. The most sustainable wind farm is the one that's already build. 75-80% of a windfarm's CO<sub>2</sub> footprint is emitted before operations – so the longer assets are preserved, the more is gained from CO<sub>2</sub> already spend. We can see the carbon footprint dropping with up to 25% when extending lifetime of windfarms with 10 years, due to high increase in energy return of investment with almost no extra emissions in the extra 10 years of lifetime (measured as kg CO<sub>2</sub>/MWh).

In summary, we estimate for a 10-year lifetime extension:

- 20-25% expected improvement on climate change impact category (20-25% reduction of carbon footprint measured as kg CO<sub>2</sub>/MWh)
- Expected EROI (energy return of investment) increase with 30-35%

Lifetime extension can also help lower supply chain pressure in our industry. Material scarcity and supply chain bottlenecks are big risks to green energy transition. Lifetime extension of our windfarms with 5-10 years could slow down the demand for wind farms (i.e. new materials and components) and ensure we spend available materials more wisely, where most needed.

Further, lifetime extension has a potential positive impact on people retaining direct (as well as indirect) jobs as well as positively impact local communities and wider socio-economic groups. Maintenance activities for another 10 years sustain demand for local suppliers on repair and refurbishment services.

As mentioned, a Nature 2000-screening and an Annex IV species assessment has been carried out as part of the application. Please see the full report in appendix 1.

The facility owner must prepare a Natura 2000-screening (*væsentlighedsvurdering*), based on the latest knowledge, outlining the potential impacts of the project on Natura 2000 sites. This also applies in situations where a time-limited permit is to be extended, even if permission is sought to continue an unchanged activity.

The Natura 2000-screening concludes, that nor bats or birds will be significantly affected by the lifetime extension of NHP. The conclusion applies both to the project itself and to the project in conjunction with other relevant plans and projects.

It is assessed the life extension of NHP will not prevent maintenance/achievement of favorable conservation status nor prevent fulfillment of conservation objectives inside the Natura 2000 site no. 173.

According to the guideline: "*Vejledning om ansøgnings- og tilladelsesprocessen for repowering og forlængelse af elproduktionstilladelse (levetidsforlængelse) af bestående elproduktionsanlæg på havet (Energistyrelsen, 2024)*", the owner of an offshore windfarm must submit an Annex IV species assessment based on up-to-date knowledge. This also applies in situations where a time-limited permit is to be extended, even if permission is sought to continue an unchanged activity.

Annex IV species include, among others, all bat and whale species.

The Annex IV species assessment concludes, based on the very short impact distances of operational noise and the fact that harbour porpoise activity in the area has slowly been increasing over the years since the onset of operation, it is assessed that the lifetime extension of NHP will not affect harbour porpoises and the protection according to annex IV will continue to be maintained.

The current knowledge implies that the vast majority of bats registered near the NHP area are registered offshore when the wind speed is low (6 m/s or less) and in many cases below cut-in speed of the wind turbines at NHP. Also, the current knowledge implies, that bats are mainly in the area during the migrating period spring and autumn. To ensure, that the assessment of the need for necessary mitigation is based on updated and specific knowledge on bat activity in NHP, a bat monitoring program has been initiated at NHP in the period July 2024 to October 2026. The purpose is to gather information on the occurrence of bats around the turbines and on land near NHP as well as investigate whether the turbines have an attraction to bats that migrate across open sea.

In case the monitoring 2024-2026 confirms presence of bats near the turbines of NHP it is a possibility to implement mitigation measures as part of a future permit for NHP. Further, the period 2026-2028 allows for any improved knowledge about potential alternative and/or better mitigation measures, which can be implemented prior to the lifetime extension of NHP.

Thus, it is assessed that the lifetime extension will not affect species of bats and the protection according to annex IV will continue to be maintained.

## 2. Background and existing infrastructures

NHP south of Lolland and the Rødsand lagoon was built in 2003. The offshore wind farm was built with a total of 72 2.3 MW wind turbine generators with a total capacity of 165.6 MW. The closest turbine is located approx. 10 km from land.

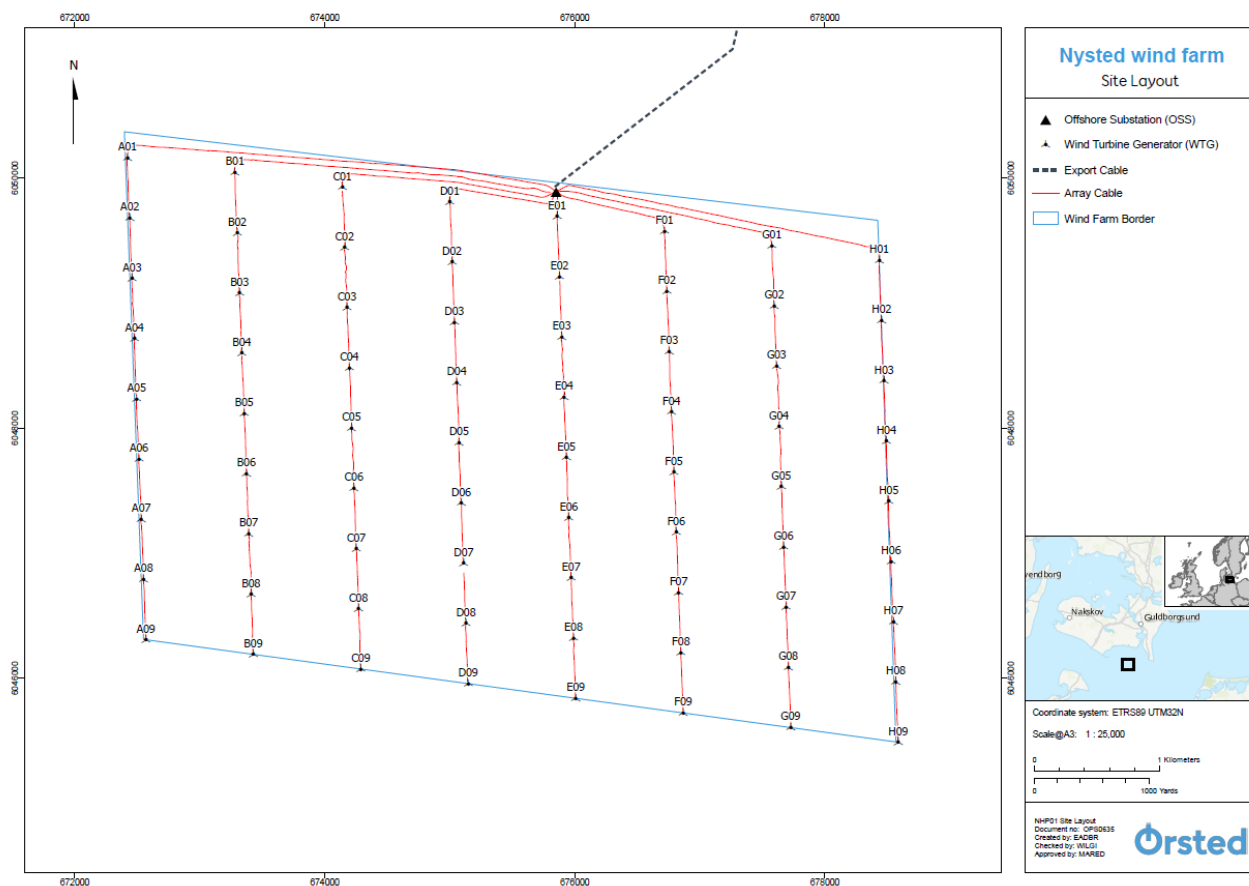


Figure 1. Site layout of NHP

At present NHP consists of 70 turbines of 2.3 MW in originally eight rows each with 9 turbines. The windfarm is connected by internal cables laid out in straight lines between the turbines. The distance between the rows is 850 meters and the distance between the turbines in the individual rows is 480 meters. An export cable connects the windfarm to the onshore grid. The water depth within the windfarm area varies between 5 and 15 meters. An overview of the technical specifications of the wind farm is provided in Table 1 below.

Parameter	Dimension
Construction year	2003
Total capacity (MW)	165.6 MW (161 MW currently)
Original number of WTGs	72 (70 currently)
Capacity pr. turbine (MW)	2.3 MW
Total height (m)	109
Hub height (m)	68
Tower height (m)	66
Rotor diameter (m)	82.4
Tip clearance (distance from surface of the sea to the lowest wing tip)	27
Swept area (m <sup>2</sup> )	5,300

Table 1. NHP specifications

The turbines are placed on gravitation foundations cast in concrete; cone-shaped concrete benches that stand on the seabed and protrude above the sea surface, see figure 2 below.

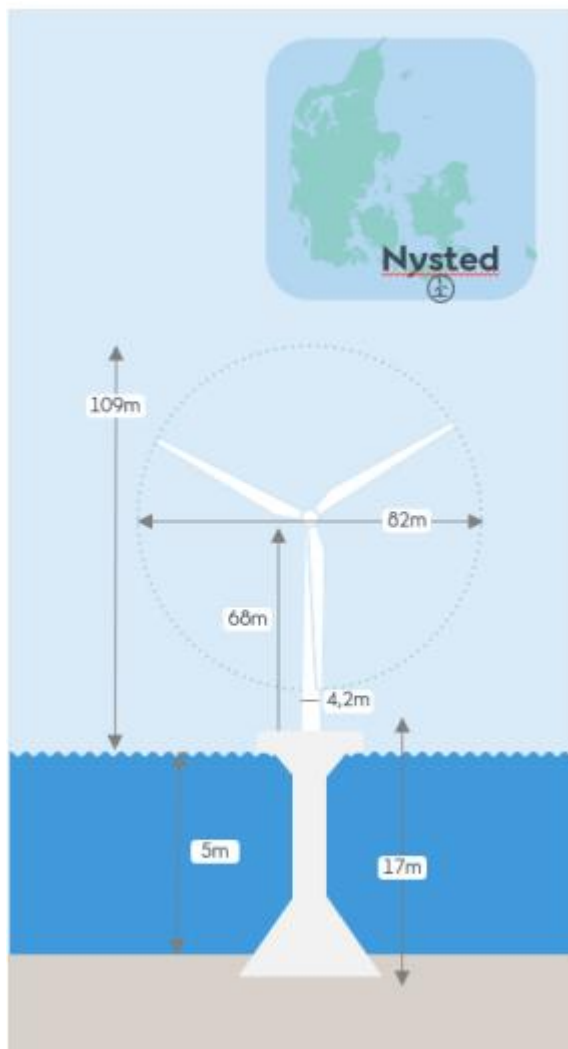


Figure 2. Design of WTC and foundations at NHP.

## 2.1 Ownership

NHP (Nysted I) is owned 50/50 by Nysted Havvindmøllepark K/S (CVR no. 35 85 17 71) and Nysted I A/S (CVR no. 31 16 44 86). Nysted I A/S is jointly owned by Ørsted Wind Power A/S (85.5%) and Stadtwerke Lübeck GmbH (14.5%) while Nysted Havvindmøllepark K/S is fully owned by PensionDanmark A/S. Nysted I is operated by Ørsted Wind Power A/S.

## 2.2 Relevant stakeholders

### Energinet

In conjunction with this requested operational lifetime extension, Ørsted notes that a continuation of the generation and distribution of renewable energy from NHP/Nysted I is fully dependent on the provision of the existing grid infrastructure, which is owned and operated by Energinet. Ensuring alignment with Energinet is important for the continued operations of the grid infrastructure during

the proposed extended operational period, emphasizing the relevance of Energinet's involvement and collaboration in the ongoing application process. A dialogue with Energinet is ongoing.

## 2.3 Existing permits

The Danish Energy Agency originally approved the establishment of NHP by granting a construction permit on 27<sup>th</sup> July 2001 to Energi E2, the original applicant. The permit was based on an Environmental Impact Assessment (EIA) submitted on 1<sup>st</sup> August 2000. The production license was granted on 10<sup>th</sup> June 2003 and subsequently replaced by the current electricity production license granted to "DONG Energy Nysted I A/S" on the 21<sup>st</sup> December 2007. DONG Energy Nysted I A/S changed its name to Nysted I A/S on 23<sup>rd</sup> October 2017.

A comprehensive Environmental monitoring program was conducted at the windfarm before, during and after construction in the period 1999-2011. An overview of the monitoring program is provided here (see also ref. 1 and 2):

Survey	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Visualization and socio-economic	✓	✓			✓	✓							
Hydrography and coastal morphology	✓	✓		✓	✓	✓							
Benthic flora and fauna, wind farm area	✓		✓				✓						
Benthic flora and fauna, export cable	✓	✓	✓	✓	✓	✓							
Artificial reef effect					✓	✓	✓						
Fish, wind farm area	✓	✓											
EMF and fish			✓	✓	✓	✓							
Harbour porpoises			✓	✓	✓	✓	✓						
Seals	✓			✓	✓	✓	✓						
Birds	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Birds, cumulative effects													✓

Table 2. Overview of environmental monitoring conducted at NHP 1999-2011.

## 3. Lifetime Extension, project description

The intention is to continue the operation of NHP from 2028 to 2038. From a technical and operational perspective, no major changes are considered required to extend the lifetime for an additional period of 10 years.

The continued operation of NHP will be subject to regular maintenance and inspections in accordance with Danish legislation and regulation, including administrative order no. 648 of 31/05/2023, internal guidelines and the OEM service manuals supported by digital monitoring as further described below.

Following the overturning of the A02 turbine in 2022, thorough internal and external investigations of the foundations have since been conducted by Ørsted/ Nysted I A/S, for which Rambøll provided third party analysis to ensure impartial results. Based upon the investigation, Ørsted/ Nysted I A/S concludes that lifetime extension is feasible. Ørsted/ Nysted I A/S can lever existing control monitoring systems to ensure continuous surveillance of the foundations and other relevant support structures. The digital monitoring combined with a thorough inspection and a maintenance schedule, compliant with Danish legislation including administrative order no. 648 of 31/05/2023, will secure optimal conditions for structural integrity. Ørsted/ Nysted I A/S notes that notwithstanding these

measures it's not possible to warrant that no further turbines will at some point need to be taken out of operations before 2038. On the remaining part of our structural turbine components (blades, nacelle, tower) no major issues have been identified and continued preventive monitoring and inspections will be performed.

For the non-structural parts all major components and the control system have been assessed and maintenance and inspection schedule has been adjusted accordingly to secure a high level of technical integrity. Inspections and maintenance will be conducted according to Danish legislation including administrative order no. 648 of 31/05/2023. To retain a high technical availability, retrofits, upgrades, and major component exchanges will also be a part of the operational strategy. However, to make larger investments in the retrofit of non-structural but critical major components lifetime extension approval of the operating permit must be obtained. To maintain needed cybersecurity, it has been agreed to update the SCADA system at NHP to ensure relevant protection for a potential extended period of operations. This update does not incur any changes in the power output or quality.

## 4. Nature 2000-screening and Annex IV species assessment

To continue operations of NHP beyond 2028, a permit according to Section 29, Subsection (1), of the Renewable Energy Act is required from the Danish Energy Agency. Part of the application process includes a Natura 2000 assessment of protected habitats and species according to the Habitat Directive. This section contains an Annex IV species assessment and a Natura 2000-screening of the lifetime extension of Nysted OWF, and the conclusion from these assessments is briefly listed in the following sections. The full report "Lifetime extension of Nysted Offshore Windfarm, Nature 2000-screening and Annex IV species assessment" is found as appendix 1.

### Natura 2000-screening

There are several both Danish and German Natura 2000 sites in close proximity to NHP. Based on the potential impacts caused by the lifetime extension, it is only Natura 2000 site no. 173: Smålandsfarvandet that is relevant for the assessment of the lifetime extension of NHP. The relevant species, that the Natura 2000 site is appointed to protect and that could be impacted by the lifetime extension is pond bat and western barbastelle and mute, whooper swan, common goldeneye, the smew, goosander, and the Eurasian coot. These species are included in the Natura 2000 screening.

The Natura 2000 screening concludes, that nor bats or birds will be significantly affected by the lifetime extension of NHP. The conclusion applies both to the project itself and to the project in conjunction with other relevant plans and projects.

It is assessed the lifetime extension of NHP will not prevent maintenance/achievement of favorable conservation status for the western barbastelle, pond bat and birds nor prevent fulfillment of conservation objectives for the western barbastelle, pond bat and birds inside the Natura 2000 site no. 173.

### Annex IV species assessment

The Annex IV species assessment concludes that harbour porpoise and four species of bats: nathusius' pipistrelle, soprano pipistrelle, parti-coloured bat and common noctule could potentially be affected by the lifetime extension of NHP. Harbour porpoise and the four bat species are therefore included in the Annex IV assessment.



Based on the very short impact distances of operational noise and the fact that harbour porpoise activity in the area has slowly been increasing over the years since the onset of operation, it is assessed that the lifetime extension of NHP will not affect harbour porpoises and the protection according to annex IV will continue to be maintained.

Knowledge implies that the majority of bats registered near the NHP area are registered at night during migration in spring/autumn when the wind speed is low and often below cut-in speed of the wind turbines at NHP. There is an ongoing monitoring program on bats at NHP. The results and subsequent analyses will conclude whether mitigation measures should or should not be a part of the lifetime extension for NHP, when the current permit expires in 2028.

Depending on the results on the ongoing bat monitoring program at NHP, requirements of mitigation in a permit for the lifetime extension for NHP after 2028, will ensure, that no impact is made on bats as Annex IV species if bats are found to present at NHP. The period 2026-2028 also allows for any improved knowledge about potential alternative and/or better mitigation measures, which can be implemented prior to the lifetime extension of NHP. If mitigation measures are needed this will ensure, that the lifetime extension of NHP will not affect species of bats and hence that the protection of bats according to annex IV will continue to be maintained.

## 5. Concluding remarks

No major deviations are intended to be conducted from the current operations of NHP. Thus, the assessments of potential environmental impacts for this application assumes an extension of current operation for a period of up to 10 years with no major changes to the windfarm and its infrastructures.

It's assessed that the lifetime extension of NHP 10 years will not prevent maintenance, achievement or fulfillment of favorable conservation status or objectives for protected species inside the Natura 2000 site no. 173. It is also assessed that marine mammals will not be affected and the protection according to annex IV will continue to be maintained.

In case the monitoring 2024-2026 confirms presence of bats near the turbines of NHP it is a possibility to implement mitigation measures as part of a future permit for NHP. Thus, it is assessed that the lifetime extension will not affect species of bats and the protection according to annex IV will continue to be maintained.

## 6. References

- [1] The Environmental Group (2013). Danish Offshore Wind – Key Environmental Issues –a Follow-up. Published by The Environmental Group: The Danish Energy Agency, The Danish Nature Agency, DONG Energy and Vattenfall. February 2013.  
[https://ens.dk/sites/ens.dk/files/Vindenergi/havvindmoellebog\\_web1.pdf](https://ens.dk/sites/ens.dk/files/Vindenergi/havvindmoellebog_web1.pdf)
- [2] The Environmental Group (2006). Danish Offshore Wind – Key Environmental Issues. Published by The Environmental Group: The Danish Energy Agency, The Danish Nature Agency, DONG Energy

and Vattenfall. <https://ens.dk/sites/ens.dk/files/Vindenergi/miljoeovervaagningsrapport.pdf>

- [3] Miljøstyrelsen (2023). Natura 2000-plan 2022-2027. Smålandsfarvandet nord for Lolland, Guldborgsund, Bøtø Nor og Hyllekrog-Rødsand.

## Appendixes:

- [1] Attached: Lifetime extension of Nysted Offshore Windfarm, Nature 2000-screening and Annex IV species assessment, August 2024