Aflandshage Offshore Wind-farm

Geotechnical and geophysical surveys – summary for ESPOO hearing

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1 Introduction

Aflandshage Offshore Windfarm is planned to be constructed in Oresund south of Aflandshage in a project area of roughly 56.5 km^2.

As part of the construction process for Aflandshage Offshore Windfarm, geotechnical and geophysical pre-investigation surveys will be carried out, in order to elucidate the seabed conditions in the windfarm area and the cable corridor. The primary possible impacts by the geotechnical and geophysical surveys will be underwater noise from the seismic surveys. The degree of this impact on marine mammals is assessed as they are particularly sensitive to underwater noise.

A theme report describing and assessing these impacts has been prepared. All other possible environmental impacts caused by the geophysical and geotechnical surveys have been assessed as negligible.

The report is part of the overall environmental impact assessment (EIA) of Aflandshage Offshore Windfarm and thus is part of the basis for the permits that the Danish Energy Agency and Hvidovre municipality have to prepare for the project in accordance to the sustainable energy act (LBK nr 1791 af 02/09/2021) and the environmental assessment act (LBK nr 1976 af 27/10/2021).

The full EIA report for Aflandshage Offshore Windfarm (NIRAS, 2021) contains a detailed description of the project, as well as descriptions of the legal basis, processes and history and the impact assessments of all other relevant possible environmental impacts of the project.

Thus, a more detailed description of the project can be found in the EIA report.

2 Summary of the theme report

The goal of the theme report is to describe and assess the environmental impacts of the geophysical and geotechnical surveys on the three most common marine mammal species (harbour porpoise, harbour seal and grey seal) in the project area for Aflandshage Offshore Windfarm. The only relevant impact from the surveys is underwater noise caused by the seismic surveys which could affect marine mammals. Thus this is the only environmental impact assessed in the report.

2.1 Basis for the assessments

The assessments in the theme report are based on existing knowledge of the presence and distribution of marine mammals in the area. Throughout the last 20 years, a multitude of studies of marine mammals in and around the project area for Aflandshage Offshore Windfarm, have been carried out. Furthermore, bird counts from aircraft have been carried out as part of the environmental assessments of Aflandshage Offshore Windfarm and during these counts, any marine mammals observed were also logged in order to support the existing knowledge on the distribution of marine mammals and their use of the project area. In total eight counts were carried out from October 2019 to September 2020.

Based on existing knowledge and the aircraft counts, it can be concluded that there is a low density of harbour porpoise in the project area of Aflandshage Offshore Windfarm and the area has not been identified as a calving and nursing ground for harbour porpoise. The porpoises that are present in the area are part of the stable Belt Sea population but a few individuals from the critically endangered Baltic Sea population can also be present in the area (only during winter). There

are two larger seal colonies relatively close to the project area of Aflandshage Offshore Windfarm. The closest colony is at Måkläppen in southwestern Skåne, roughly 10 km east from the project area. The other seal colony is on the island of Saltholm and the surrounding islands in the southern part of Oresund. This colony lies roughly 18 km north from the project area. Both harbour seals and grey seals from both colonies can be found in the project area, but the area is not identified as an important feeding ground for either species. The possible impact on marine mammals caused by the seismic surveys in the windfarm area and cable corridor is short in duration, but the underwater noise generated by the equipment used can potentially affect the hearing of marine mammals and cause permanent threshold shift (PTS), temporary threshold shift (TTS), behavioural changes or displace the marine mammals.

2.2 Mitigation measures

The following mitigation measures should be used during the seismic surveys in order to minimize the impact:

- The seismic surveys should start with a 30 minute soft-start/ramp-up to full effect, in order to ensure that porpoises and seals are outside of the risk zone for TTS and PTS.
- Passive acoustic monitoring should be used and observers should be onboard the survey vessel in order to ensure that no marine mammals are in the immediate vicinity of the survey vessel when the seismic surveys are initiated.
- If the seismic surveys are interrupted, they should be restarted with another soft-start procedure.

2.3 Impact assessment

By implementing the previously mentioned mitigation measures, the risk of porpoises being inside the area where they could be subject to PTS or TTS is greatly reduced and thus the assessed risk of temporary or permanent threshold shift caused by the equipment used during the seismic surveys is negligible. Based on worst case assumptions up to 4 porpoises will be subject to behavioural changes during summer, which equates to roughly between 0.009% and 0.02% of the biogeographical population in the area. During winter, up to 2 porpoises will be subject to behavioural changes equating to less than 0.001% of the Belt Sea population or less than 0.4% of the Baltic Sea population if it is assumed that both porpoises belong to this population, which is very improbable. As a very small percentage of the populations could be subject to behavioural changes, it is assessed that the impact thereof on harbour porpoises will be small to negligible.

The impact of underwater noise caused by the seismic surveys on harbour seals and grey seals is assessed as negligible, as a very small part of the home range of the seals is temporarily affected by the underwater noise. Furthermore, no seals will be subject to temporary threshold shift as it is assumed that an adequate soft-start procedure is used.

The protection of harbour porpoise, harbour seal and grey seal is part of the conservation objectives for a multitude of Danish and Swedish marine Natura 2000-sites. During the seismic surveys, a nearby Natura 2000-site (SE0430095 Falsterbohalvön) which is designated to protect both harbour porpoises, harbour seals and grey seals, will be affected by underwater noise levels surpassing the threshold for evasive behaviour. Less than 2% of the total area of the Natura 2000-site will be affected at this noise level. By implementing the suggested mitigation measures, no individuals will be at risk of permanent or temporary threshold shift

in the Natura 2000-site. Therefore, it is assessed that the seismic surveys in the windfarm area of Aflandshage Offshore Windfarm will not harm or negatively impact the short term or long term conservation status of harbour porpoise (neither for the Belt Sea population or Baltic Sea population), harbour seal or grey seal in SE0430095 Falsterbohalvön or hinder the achievement of the conservation goals for harbour porpoise, harbour seal or grey seal in the Natura 2000-site SE0430095.

Harbour porpoise is listed in Annex IV of the Habitats Directive and thus are strictly protected anywhere it is present. It is concluded that the Annex IV-protection of harbour porpoise is not violated as the seismic surveys will not result in any capture, killing or severe disruptions of porpoises or damage/destroy their breeding or resting areas. Therefore it is assessed that the seismic surveys will not impact the ecological functionality of the area for porpoises (both from the Belt Sea population and the Baltic Sea population).

2.4 Transboundary impacts

The project area for the windfarm borders the Swedish Exclusive Economic Zone (EEZ) and thus, underwater noise from the geotechnical surveys can extend into Swedish waters.

The impact on marine mammals caused by underwater noise from the seismic surveys will be short and the modelled impact distances are limited. By implementing the previously mentioned mitigation measures, the risk of porpoises being inside the area where they could be subject to PTS or TTS is greatly reduced and thus the assessed risk of temporary or permanent threshold shift caused by the equipment used during the seismic surveys is negligible. As previously mentioned, in the worst case scenario, up to 4 porpoises will be subject to behavioural changes during summer, which equates to roughly between 0.009% and 0.02% of the biogeographical population in the area. During winter, up to 2 porpoises will be subject to behavioural changes equating to less than 0.001% of the Belt Sea population or less than 0.4% of the Baltic Sea population if it is assumed that both porpoises belong to this population, which is very improbable. As a very small percentage of the populations could be subject to behavioural changes, it is assessed that the impact thereof on harbour porpoises will be small to negligible. The impact on both harbour seal and grey seal will be negligible as no seals will be subject to temporary threshold shift with implementation of the previously mentioned remedial measures.

The impact of underwater noise from the seismic surveys on marine mammals in Swedish waters, including the Swedish Natura 2000-site SE0430095 Falsterbohalvön, are assessed as small to negligible based on the extend and short duration of the impact.