

Authority Services

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Swedish Environmental Protection Agency
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Finland's response to the notification in accordance with Article 3 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) for the planned offshore wind farm "Bothnia Offshore Lambda" in Sweden's exclusive economic zone

The Finnish Environment Institute acknowledges that Finland has received a notification dated 8 March 2023 and consultation documents from Sweden. The notification is based on Article 3 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), and it concerns an environmental impact assessment (EIA) procedure of the planned offshore wind farm, "Bothnia Offshore Lambda" (hereinafter "**the Project**"), in the Bothnian Sea in Sweden's exclusive economic zone (EEZ) (hereinafter "**the Project Area**").

The developer, Njordr Offshore Wind AB, plans to investigate the possibility to establish an offshore wind farm in Sweden's EEZ, approximately 55 kilometres east of the city of Hudiksvall, Sweden. The Project Area is 323 square kilometres. The Project is estimated to consist of a maximum of 93 wind turbines with a potential for 1 600 MW of installed capacity and an annual production up to 6 TWh. The individual turbines within the Project will be coupled via an internal cable network that transmits the produced energy to one or more offshore substations (OSS) where the electricity will be converted and transmitted to shore through one or more connecting cables.

Consultation in Finland

According to the amended Finnish Act on Environmental Impact Assessment (252/2017), the Finnish Environment Institute is the competent authority and responsible for information and consultation tasks under the Espoo Convention. The Swedish Environmental Protection Agency requested an indication whether Finland wishes to participate in the EIA procedure of the Project, comments concerning the scope for the assessment of the environmental impacts of the Project in Finland, and comments from the public in Finland.

Based on the received statements and reflecting its own views, the Finnish Environment Institute states that Finland will participate in the EIA procedure of the Project.



The public and the authorities in Finland were given the opportunity to comment on the consultation documents from 15 March to 18 April 2023. The consultation documents were available, and statements were asked on the joint website of Finland's environmental administration website and on lausuntopalvelu.fi website.

Statements were also asked from relevant authorities, agencies, and marine and environmental organisations in Finland which of the following submitted their statements: the Finnish Border Guard, the Finnish Heritage Agency, the Government of Åland, the Finnish Transport and Communications Agency (Traficom), the Finnish Transport Infrastructure Agency (Väylävirasto), Ålands Natur & Miljö, Fingrid Oyj, the Finnish Nature Panel, the Regional Council of Satakunta, the Finnish Meteorological Institute (FMI), the Ministry of Transport and Communications, the Finnish Professional Fishermen's Association (SAKL), the Finnish Wildlife Agency, and the Centre for Economic Development, Transport and the Environment (ELY Centre) in Southwest Finland.

Remarks received during the consultation

The Finnish Environment Institute has made an unofficial summary of the received statements in Finland. The original statements are enclosed to this letter.

The Finnish Border Guard has no comments on the matter.

The Finnish Heritage Agency considers, from the perspective of underwater cultural heritage, that there is no need for Finland to participate in the EIA procedure. Underwater cultural heritage objects are physical objects located within a specific area which are often subject to survey, conservation and research activities without concrete transboundary environmental impacts. The Finnish Heritage Agency does not comment on content of the consultation documents.

The Government of Åland considers that there is no need for Åland to participate in the EIA procedure. The distance is considered to be sufficient for Åland not to be affected by construction and operation of the Project.

The Finnish Transport and Communications Agency (Traficom) considers it reasonable for Finland to participate in the EIA procedure. Considering the Project's location, as well as other offshore wind projects planned in the vicinity of the Project Area, the projects may have impacts on navigation to and from Finland, especially in ice conditions. Large-scale offshore wind farms, and especially offshore wind farms located close to each other, if constructed, would have a significant impact on marine traffic in the Gulf of Bothnia, both in terms of security and smoothness of navigation.

Traficom states that in the delineation of planned offshore wind projects, it is important to consider the routes used for navigation outside the established fairways and routing systems, so that operational and security conditions of navigation are considered in the Project Area. The traffic routes for navigation in winter must be considered. These routes differ from the routes used in open water and may not be clear from AIS-based traffic flow analyses of the traffic flow.

Traficom emphasis that potential combined impacts on navigation in the Bothnian Sea region should be comprehensively investigated in the planning. The Project's impacts on ice conditions needs to be examined. Traficom emphasis that large-scale and closely located offshore wind



farms can concentrate navigation routes. Tens or even hundreds of wind farms, if constructed, will disrupt mobile ice fields in the region. As a result, the amount of ice in the Project Area is likely to increase and accumulate, which will impact on, *inter alia*, organisation of winter navigation. Spillover effects may extend beyond the Project Area. Traficom considers it important that icebreaking authorities in Sweden and Finland are consulted, so that icebreaking cooperation and winter navigation routes can be considered in the planning, and the overall view of the marine environment and any changes to it are brought to the attention of the authorities as early as possible.

The Finnish Transport Infrastructure Agency (Väylävirasto) considers it reasonable for Finland to participate in the EIA procedure. Large-scale offshore wind farms, and especially offshore wind farms located close to each other, have a significant impact on marine traffic in the Gulf of Bothnia, both from the perspective of security and smoothness of navigation. Väylävirasto highlights the importance of taking into consideration the traffic routes for navigation outside the established fairways and routing systems. The traffic routes used for navigation in winter must be reviewed.

Väylävirasto emphasizes that potential combined impacts of offshore wind projects on navigation in the Bothnian Sea should be comprehensively investigated in the planning. Large-scale and closely located wind farms can concentrate traffic routes for maritime transport. Tens or even hundreds of wind farms, if constructed, will disrupt mobile ice fields in the area, which can impact, for example, organisation of winter navigation. In order to consider icebreaking cooperation and winter navigation routes in the planning of offshore wind farm projects outside territorial waters, Väylävirasto considers it important that icebreaking authorities in Sweden and Finland are consulted.

Ålands Natur & Miljö considers that Finland should participate in the EIA procedure, and states that the Project must not be built in locations which endanger the threatened seabird population, migratory birds and other bird species in the Baltic Sea. In addition, the Project must not disturb or threaten the low population of herring, migrating sea salmon and/or other fish species and aquatic organisms in the Baltic Sea. Ålands Natur & Miljö states that the Project could impact on Åland in regard to migratory animals (e.g., birds and bats). In addition, there is insufficient data on birds, migratory bats and migratory insects. The EIA should include investigation of noise impacts on marine mammals during construction and impacts on fish species in the area.

Fingrid Oyj has no comments on the matter.

The Finnish Nature Panel considers that Finland should participate in the EIA procedure. The Finnish Nature Panel states that especially in marine areas, habitat impacts extend beyond national territorial waters, and there is an increased need to understand better and consider impacts of offshore wind farm projects on habitat, including cumulative impacts. The Finnish Nature Panel states that the consultation document reviews the natural values of the Natura 2000 sites in the area and assesses that the Project's potential impacts on birds, bats, fish, marine mammals and benthic fauna should be examined in the EIA procedure.

The Finnish Nature Panel considers that the consultation document reviews potential impacts on nature in a rather cursory and general way. Therefore, it is important that the EIA aims at a comprehensive assessment of the Project's direct and indirect impacts on nature and that adequate measures are proposed to increase the knowledge also during the operation of the



Project. The Finnish Nature Panel emphasizes that the EIA should address at least the following impacts on nature, which may extend into Finnish territorial waters:

1. The Project's impacts on feeding opportunities for sea ducks in shallow waters and movements to and from feeding areas.
2. The Project's impacts on open sea birds (e.g., auks). These species are generally not well known and may move over large areas and use different sites, for example for feeding.
3. In the light of current knowledge, a risk of birds colliding with turbine blades is considered to be low in the open sea, and birds are known to avoid power plant sites. Because of this avoidance, power plants are a barrier to birds and any potential cumulative impacts with other planned projects should be investigated in the EIA for this Project.
4. Potential impacts on fish stocks, especially migratory fish (e.g., salmon and eel). Some mitigation measures during construction were presented in the consultation document. These should be reviewed in more detail in the EIA, especially concerning potential cumulative impacts.
5. The consultation document provides that wind turbines can have an impact on current conditions, and that this will be further investigated in the EIA, including cumulative impacts. For example, in the North Sea, wind wake effect from large offshore wind turbines has been found to cause changes in seawater stratification, reduced currents and lower seabed oxygen levels in areas where oxygen levels were already low.¹ The influence of wake currents can cause changes in benthic biota and occurrence of coalescing algae. The impact can extend up to tens of kilometres from the Project and therefore combined impacts with other wind farms planned in the area should be assessed.

The Finnish Nature Panel states that the EIA programme is described in the consultation document at the headline level. A separate section could be added for measures to avoid, minimise and possibly compensate for any adverse impacts. In addition, potential transboundary impacts could be presented under separate heading: what direct, indirect or cumulative impacts, if any, the Project may have, extending into Finnish territorial waters, concerning both other planned wind farms and other human activities. In addition, under section "*Alueen merivirtoja ja suolapitoisuutta koskevien mallitietojen kehittäminen*"² could be mentioned a study for wind wake effects.

The Regional Council of Satakunta considers it necessary for Finland to participate in the EIA procedure. The Regional Council of Satakunta highlights that the Finnish Marine Spatial Plan 2030 should be considered in the EIA procedure. The Finnish Marine Spatial Plan 2030 identifies potential areas for offshore wind development. The Finnish Marine Spatial Plan 2030 does not have legal effect, but its effectiveness is based on extensive stakeholder cooperation and coordination of the objectives of different sectors. The Regional Council of Satakunta stresses the importance of an open, interactive and sufficiently broad assessment process for large-scale offshore wind projects. The Regional Council of Satakunta wishes to be informed of the Project's progress.

¹ Daewel, U., Akhtar, N., Christiansen, N. & Schrum, C. 2022. Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. *Communications Earth & Environment*, 3:292. <https://doi.org/10.1038/s43247-022-00625-0>, and Floeter, J., Pohlmann, T., Harmer, A. & Möllmann, C. 2022. Chasing the offshore wind farm wind-wake-induced upwelling/downwelling dipole. *Frontiers in Marine Science*. <https://www.frontiersin.org/articles/10.3389/fmars.2022.884943/full>

² In Swedish: "Framtagande av modelldata för havsströmmar och salinitet i området"



The Regional Council of Satakunta states that the EIA should consider possible impacts on the Finnish territory. The wider impacts that need to be examined include, *inter alia*, birds and fish. The Gulf of Bothnia is an important migration route for birds, and fish stocks' state concerns the entire Bothnian Sea and the Gulf of Bothnia. The consultation document indicates that information on birds, *inter alia*, is still incomplete. The EIA should also focus on navigation and consider varying ice conditions in the area. Combined effects of the offshore wind projects planned in the Bothnian Sea should also be examined.

The Regional Council of Satakunta emphasis that as offshore wind power has an impact on other activities at the sea and on important industries in the Bothnian Sea (e.g., navigation and fishing) as well as on environment and natural ecosystems, there is a need to coordinate project planning across the entire Gulf of Bothnia. In addition, energy transfer associated with offshore wind power has an impact on environment, ecosystems and land use in onshore areas. The Regional Council of Satakunta states that closer cooperation between states is needed to support a controlled development pattern and to assess the overall impact.

The Finnish Meteorological Institute (FMI) considers that the Project impacts on marine observations and makes it especially difficult to carry out autonomous observations, but also observations from a vessel near the Project. Although FMI has not carried out autonomous monitoring in the Project Area, there is a monitoring point nearby. FMI states that measurements made by Swedish operators (such as SMHI) are beneficial. Therefore, FMI considers it necessary that the relevant Swedish operators are involved in the EIA procedure, so that marine measurements that impacts on the monitoring of the entire Baltic Sea can also be carried out after the Project has been constructed.

FMI considers that the Project impacts on marine disturbance and sediment re-suspension which is likely to have a positive impact on the overall ecological status. However, the Project may change sedimentation locally which may adversely impact the ecological status of the sea. Therefore, it would be important that the sediment re-suspension is considered in the EIA procedure. FMI states that it is not decisive for the issue that FMI is part of the EIA procedure, but it is important that the relevant Swedish operators are involved. As the nearest weather radar is more than 20 kilometres from the Project, FMI has no comments regarding whether radar network.

The Ministry of Transport and Communications states that, from the perspective of security and smoothness of year-round navigation, it is reasonable for Finland to participate in the EIA procedure. The green transition has led to an increase of interest in offshore wind power which is reflected in the number of projects planned in territorial waters and, increasingly, in the EEZs of Finland and Sweden.

Now projects are being planned in deeper waters, and the size of wind farms has also grown. Offshore wind farms can have significant impacts on smoothness and security of navigation, especially if they are built in a heavily trafficked area. Impacts on navigation are possible, especially when projects are located close to each other. The Ministry of Transport and Communications states that other offshore wind farms are planned in the vicinity of the Project in the Bothnian Sea, and therefore it is important that the EIA considers combined impacts of the projects to the extent as possible. As part of the EIA, the Project's impacts on ice conditions and winter navigation in the area must be assessed.



The Finnish Professional Fishermen's Association (SAKL) considers it necessary for Finland to participate in the EIA procedure and follow its progress. The Bothnian Sea, the Bothnian Bay and the Baltic Sea are important for Finland's fishing industry. SAKL states that the Ministry of Agriculture and Forestry and the Natural Resources Institute Finland (Luke) can provide more information on catch monitoring and VMS.

SAKL states that the Project's impacts on fisheries in the Bothnian Sea must be investigated and the information obtained must be critically examined. SAKL states that the Project Area forms practically a no-fishing zone. The Project Area's long-term significance for commercial fishing must be assessed. The Bothnian Sea has traditionally been a very important fishing area for herring and sprat, and most of Finland's catches are taken in the Bothnian Sea. The shallow waters of the Bothnian Sea are also important spawning grounds for herring. Migratory fish (salmon and whitefish) move through the Bothnian Sea. Impacts of the Project and cable lines, especially on migratory fish, need to be thoroughly investigated. The Project's cumulative impacts with other planned projects should especially be examined.

SAKL states that large-scale industrial activities and thousands of offshore wind power turbines impacts on the state of marine nature, fish stocks, birds and fisheries. Due to the fact that cumulative impacts of different projects on nature and fish stocks have not been sufficiently studied, professional fishermen and SAKL are concerned about this development. SAKL states that impacts of large-scale marine construction should be studied, investigated and assessed. SAKL emphasizes that the fishing industry in Finland is small and does not have the resources to monitor the progress of projects or to control the interests of fish stocks and fisheries. SAKL also states that information on impacts of offshore wind projects on fish stocks, natural conditions and fisheries in the Baltic Sea is deficient.

The Finnish Wildlife Agency is concerned the impact of intensive renewable energy construction on natural biodiversity and fragmentation of marine and terrestrial areas. The Finnish Wildlife Agency states that the total height of European wind turbines has been increasing steadily, and area of blades more than doubles. The Finnish Wildlife Agency presents in its statement links for action plans for the conservation of certain bird species, and also figures which purpose is to concretise the scale of plans for wind power, to raise awareness of cumulative impacts and possibilities to minimise impacts (figures 1-4).

The Finnish Wildlife Agency emphasizes that the Project's impacts on migratory water birds must be assessed. Focus should be given to the known migratory routes of water birds, and flight altitude of birds should be investigated. Flight altitude on migratory routes may vary depending on weather conditions, and a risk of collision with the power plants to be built should be assessed and considered where appropriate. The Project is on the migration route of greylag goose and bean goose. The Finnish Wildlife Agency emphasizes that in order to assess risks to goose populations and possibilities to reduce mortality at critical periods, the GPS tracked birds and their flight altitude in different weather conditions should be investigated.

The Finnish Wildlife Agency emphasizes that the Project's design should aim from the outset to implement known and proven methods to minimise bird collision mortality. These include at least making towers and blades easily visible to birds (colouring). The possibilities of automatic stopping technology during migration and its application in practice should also be investigated. In addition, the EIA should examine how lights formed by the hundreds of towers impacts on navigation of birds through the area, and whether it is possible to locate turbines in a way to



minimise airspace they occupy in relation to the known migration routes of geese. In practice, this would mean positioning the power plants in a row in relation to the direction of water birds' migration routes, if technically and economically possible.

The Finnish Wildlife Agency states that sea ducks are not linked to coastal areas as described in the consultation document. The map (figure 5) in the Finnish Wildlife Agency's statement shows wintering long-tailed ducks in the Finngrundet area, Sweden. In mild winters, there have been significant flocks of long-tailed ducks off the coast of Helsinki, Finland. Due to climate change, it is possible that shallow areas of the Bothnian Sea and the Gulf of Bothnia will become significantly more important for wintering seabirds. There is no significant area of importance for seabirds in the Project Area.

The Finnish Wildlife Agency considers that the description of section 5.6.1 of the consultation document is incomplete, as is also the description in section 6.8.1.³ The shallow areas in the middle of the open sea (less than 35-40 metres), are also important habitats for sea ducks, especially as resting and wintering areas. Due to climate change, more northerly shallow areas may become important, and this should therefore be considered in the Project's construction and the consultation documents.

The Finnish Wildlife agency states that the Project's environmental impacts and the related additional studies are described in a reasonably comprehensive manner. It stresses that the construction of the Project and other offshore wind farm projects in the sea area concerned will radically change the environment of the area, especially for water birds. The Finnish Wildlife Agency proposed to the Finnish Environment Institute that the competent authority in Sweden would make a joint impact monitoring programme as a condition for the project's permits in the area, which results would be examined in periodic reviews between the states. The monitoring could use of HELCOM HOLAS II and III indicator data.

The Centre for Economic Development, Transport and the Environment (ELY Centre) in Southwest Finland does not consider that Finland should participate in the EIA procedure based on impacts of this individual Project but states that it might be beneficial for Finland to participate in the EIA procedure, as there are many offshore wind farms planned in the Bothnian Sea and the Gulf of Bothnia. The ELY Centre in Southwest Finland assess that the Project would not have a significant environmental impact on Finland's EEZ or territorial waters and would not compromise the objectives of water and marine management in Finland.

³ In Finnish: "Tällaisia alueita on joko matalilla rannikkolahdilla, joita käyttävät rannikolla elävät sukeltajasorsat (lapasotka, telkkä, tukkasotka), tai ulommalla rannikkokaistaleella ja matalilla rannikoilla, joita käyttävät merellä elävät sukeltajasorsat (haahka, alli, pilkkasiipi, mustalintu)."



Conclusion

Finland notes that the planning of offshore wind farms in the Gulf of Bothnia, the Bothnian Bay, the Bothnian Sea and the Baltic Sea has increased both in the sea areas of Sweden and Finland. Therefore, the Finnish Environment Institute considers it reasonable for Finland to participate in the Project's EIA procedure.

The EIA documentation must properly address the Project's transboundary impacts on Finland. The consultation materials do not include transboundary impacts at sufficient level from Finland's perspective. In this respect, the Finnish Environment Institute wishes that the EIA documentation includes a separate chapter for transboundary impact assessments from Finland's perspective with a specific regard given to the remarks mentioned in the statements.

Finland considers it as a high priority to examine and assess cumulative impacts to the extend as possible in the EIA. Although impact can be minor or ecologically non-significant for an individual wind farm, cumulative impacts of several wind farms in the region can be ecologically significant.

Head of Authority Services

Jorma Jantunen

Senior Officer,
Point of Contact for the Espoo Convention
and the SEA Protocol

Laura Aitala-Martesuo

This document has been electronically signed.



Appendices	Received statements in Finland
Distribution	Swedish Environmental Protection Agency
For information	Swedish Environmental Protection Agency, Richard Kristoffersson Ministry of the Foreign Affairs Ministry of the Environment Finnish Border Guard Finnish Heritage Agency Government of Åland Finnish Transport and Communications Agency (Traficom) Finnish Transport Infrastructure Agency (Väylävirasto) Ålands Natur & Miljö Fingrid Oyj Finnish Nature Panel Regional Council of Satakunta Finnish Meteorological Institute (FMI) Ministry of Transport and Communications Finnish Professional Fishermen's Association (SAKL) Finnish Wildlife Agency Centre for Economic Development, Transport and the Environment in Southwest Finland

