

Authority Services

27.2.2025

SYKE/2024/2145

Swedish Environmental Protection Agency
Richard Kristoffersson
Richard.kristoffersson@naturvardsverket.se
registrator@naturvardsverket.se

Reference: NV-06333-22

Finland's response to the consultation in accordance with Articles 4 and 5 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) for the planned offshore windfarm Olof Skötkonung in the Sea of Bothnia in Sweden's economic zone

The Finnish Environment Institute acknowledges that Finland has received the consultation request from Sweden on 13 January 2025, in accordance with Articles 4 and 5 of the Espoo Convention to submit comments on the permit application and the environmental impact assessment (EIA) for the offshore windfarm Olof Skötkonung.

Previously, Sweden notified Finland of the EIA programme for the offshore windfarm Olof Skötkonung in accordance with Article 3 of the Espoo Convention on 4 July 2022. As a response to the notification, the Finnish Ministry of Environment replied on 9 September 2022 in accordance with Article 3, Paragraph 3 of the Espoo Convention that Finland intends to participate in the EIA procedure of the planned project.

Consultation in Finland

In accordance with Section 30 (911/2022), Subsection 1 of the Finnish Act on Environmental Impact Assessment (252/2017), the Finnish Environment Institute is the competent authority and responsible for tasks under the Espoo Convention when a project in a party of the treaty or a Member State of the European Union may have significant transboundary impacts in Finland.

The Swedish Environmental Protection Agency requested to provide comments concerning the assessment of the environmental impacts of the project affecting Finland and submit comments from the public and the authorities in Finland.

The public and the authorities were given the opportunity to comment on the consultation documents from 15 January to 20 February 2025, which were available on the website of Finland's environmental administration and on the website of lausuntopalvelu.fi. Statements were also invited from relevant stakeholders.

Remarks received during the consultation

The Finnish Environment Institute received 20 statements. The Finnish Environment Institute has prepared a summary of the original statements in English below. However, the original



statements in Finnish or Swedish, which are enclosed to this letter, include important and detailed remarks which need to be examined and taken into consideration in their entirety.

Centre for Economic Development, Transport and the Environment of South Ostrobothnia

The Centre for Economic Development, Transport and the Environment of South Ostrobothnia is concerned about the project's far-reaching and cumulative impacts on water bodies.

The following problems in the submitted material make it difficult to assess the long-range impacts: the assessment report identified direct impacts on water bodies well, although the data base for the project area is rather limited. The expert assessment of the hydrodynamic impacts of the project cannot be considered very comprehensive: the impact mechanisms have been identified but should have been modelled to determine their magnitude. Modelling is standard in similar EIA procedures and would have allowed a more reliable assessment of hydrodynamic impacts. Cumulative hydrodynamic impacts from several different wind projects have not been identified at all. The results of the sedimentation modelling are clearly presented, but the interpretation does not consider the phenomenon of resuspension and does not assess the potential impact of long-term impacts on the ecosystems of the adjacent shallows (Finngrunden). The cumulative importance of sedimentation and construction noise has been identified, but the estimate seems moderately optimistic compared to the modelling presented. The reef effect is well identified, but its positive impact on fish communities is likely to be somewhat optimistic given the prevalence of reef habitats in the area and the low number of species benefiting from them. The analysis of invasive alien species does not identify any potential risks associated with the project. A shortcoming of the report is that the possible dumping of dredged material and its consequences are not discussed at all. The monitoring programme presented does not cover hydrology and aquatic organisms.

The ELY Centre of South Ostrobothnia considers that the lack of hydrodynamic modelling makes it substantially more difficult to assess the impacts of the project. The assessment of cumulative impacts is also incomplete. The ELY Centre stresses that due to the limited and incomplete data, the estimates presented in the report are subject to large uncertainties.

The ELY Centre of South Ostrobothnia estimates that the hydrodynamic impact of the project may be higher than estimated due to the project's impact on wind and its location next to a significant upwelling area (Zhang et al. 2022). Wind is by far the most important factor regulating currents in the Bothnian Sea. Changes in currents and upwelling can theoretically affect water temperatures, deep-sea oxygen levels, fish migration, food webs, water chemistry and algal blooms throughout the Bothnian Sea. Some of the potential impacts could be greater along the Finnish than the Swedish coast, as surface water in the southern Bothnian Sea generally flows east or north-east. Algal blooms in the southern Bothnian Sea are already affecting water quality along the coast of Ostrobothnia. These impacts could become cumulative, as a total of eight offshore wind projects have applied for permission in the Swedish EEZ, covering about one third of the Swedish EEZ. If the permits are granted, this project would be part of an almost uninterrupted 190 km long wind energy area, the cumulative effects of which would need to be assessed. The 4-7 km wind effect appears to be underestimated. The ELY Centre for South Ostrobothnia assumes that the so-called "Wind-Wake" phenomenon extends at least 30 km from wind turbines of the current scale (Finserås et al., 2024).

According to the ELY Centre of South Ostrobothnia, the impact of the turbidity and noise during construction on adjacent shallows may affect the ecosystem of the Bothnian Sea through the



key species Baltic herring (*Clupea harengus membras*), if spawning by this species fails repeatedly. A large part of the open sea spawning areas for the Baltic herring in the Bothnian Sea are in the area affected of the project. The risk factors include the repelling effect of pile driving noise on spawning flocks (also below the modelled TTS threshold), the effect of even slight turbidity on spawning site selection, and the effect of years of slight turbidity on the depth limits of algal zones. Baltic herring is estimated to constitute more than 90% of the fish biomass in the Bothnian Sea and its stock status affects many threatened species and ecosystem services.

The project's construction equipment and structures may pose an increased risk of invasive species compared to other marine traffic when organisms or sediment are trapped inside the equipment, when the equipment operates for a long period in the same area or, for example, when foundations are maintained in other marine areas where local organisms may become attached to them. Potential thermal emissions increase the risk of the project acting as a "stepping stone", as winter temperatures in the Gulf of Bothnia are one of the main barriers to the establishment of invasive species. The project developer's assessment that the project would not promote the spread of organisms with planktonic larval stages in the Bothnian Sea ignores the fact that many species have a dispersal distance of only tens of kilometres and may take decades to spread along the coast for this and ecological reasons.

The ELY Centre of South Ostrobothnia states that the applicant must model the hydrodynamic effects of the project, and the modelling must consider the combined effects on the Bothnian Sea caused by other offshore wind projects that have applied for a permit. The importance of the proximity of the upwelling area should be assessed in this context. Dredging operations and their consequences should be described. The cooling solution for the transformers and the heat emissions to the sea should be described. An invasive species strategy is recommended. The ELY Centre asks the licensing authority to note that the contribution of the project to cumulative turbidity and noise impacts has not been sufficiently explained. If the project is approved, construction schedules and protection measures should be synchronised with other approved projects to minimise adverse impacts. The monitoring programme should be able to detect hydrological and marine biological impacts in the vicinity and should start before construction. Comprehensive monitoring should be carried out annually during the construction period.

Centre for Economic Development, Transport and the Environment of Southwest Finland

The project's EIA report identifies well the transboundary impacts of the project on nature and focuses its assessment correctly. The ELY Centre of Southwest Finland agrees with the assessment of the transboundary impacts of the project.

The project's impacts on fish and marine mammals during the construction phase will be mainly due to construction-related impulsive noise. This impact could be mitigated using attenuation methods during the construction phase. The importance of underwater noise management is underlined by the fact that several other large wind power projects are likely to be implemented in the Baltic Sea at the same time.

Birds migrating to Finland will be affected by the project along their migration routes and resting areas. However, the mitigation needs for these impacts have been adequately addressed in the project design and the impacts on Finnish bird populations are therefore unlikely to be significant.



Further investigation and monitoring of the effects on lesser black-backed gull (*Larus fuscus*) is a good way to manage the impacts of the project. If impacts on the vertebrate population are identified as significant based on this review, the project should consider mitigation measures such as studies to stop the rotor blades in the event of a likely collision.

The ELY Centre of Southwest Finland also notes that the report and its annexes don't mention the Swedish marine management plan (havsförvaltningsplan) and its objectives.

Centre for Economic Development, Transport and the Environment of Southwest of Finland - Fisheries Authority

Opinion of the Fisheries Authority on the Environmental Impact Assessment Report

Fisheries: There have been no field studies on fisheries, but the literature review seems adequate. Mechanisms of influence have been largely identified. Noise and turbidity effects have been insufficiently investigated. The sediment modelling does not consider landfill areas, their effects and resuspension.

The impact of the construction phase of the project on Baltic herring spawning grounds in the adjacent shallows (Finngrunden) has been underestimated.

Impacts on water bodies:

The hydrological impacts, which may well also have important fisheries consequences, have been largely identified, but the hydrodynamic impacts should have been modelled. The expert assessment of the quality of the impacts is inadequate and fails to quantify the magnitude or geographical extent of the changes caused by the project.

The importance of the project area for commercial fisheries:

The impact on the commercial fishing industry has been underestimated. The value of fisheries catches has only been estimated based on catches within the project area. An assessment should be made of catches from all trawl corridors affected by the project, including those outside the project area itself.

The applicant's interpretation of the positive impact of the project on fisheries and fisheries management is incorrect.

The Fisheries Authority's assessment of the project's impact:

Effects on Baltic herring spawning and stocks during construction:

The starting point for the project must be that the construction of the offshore wind farm must not endanger the reproduction of herring and thus threaten the vitality of herring stocks. Wind farms should not be located close to Baltic herring breeding areas.

The fact that Olof Skötkonung's project area is located close to Finngrunden, where the three shallows are the main spawning grounds for Baltic herring in the open sea of the Bothnian Sea, is therefore a cause for concern for herring reproduction.

According to the applicant, the construction of the offshore wind farm will not affect the reproduction of herring in Finngrunden. The Fisheries Authority states that if the project area in practice borders on herring spawning areas, the effects are unavoidable.



Pile driving noise modelling indicates that construction noise physically affects fish up to 10-15 km away (TTS threshold). Fish can be damaged and even killed by noise. Construction noise interferes with spawning, as it does with fish behaviour in general. Construction noise and water turbidity repel fish, can disrupt fish migration patterns and can cause spawning schools to congregate on shallow slopes near spawning areas. Noise can harm fish trying to reach spawning grounds and can also disturb spawning in shallow areas. Sedimentation of solids on spawning grounds impairs the survival of roe, which can suffocate and die.

The construction activities will impair the reproduction of herring in the vicinity. The problem is exacerbated if there are several consecutive years of construction in the vicinity, when the stock may collapse. On this basis, the siting and timing of offshore wind farm projects should be based on the precautionary principle, so that the construction of the farms does not compromise the welfare of fish stocks and does not disturb and/or impede the natural reproductive cycle of the fish.

The construction of the Olof Skötkonung offshore wind farm should not be authorised, at least not as applied for. At the very least, a sufficiently wide undeveloped zone should be left to protect areas suitable for fish reproduction. Spawning in the same area must not be disturbed in successive years. Schedules must therefore be synchronised with neighbouring projects.

Impacts on fisheries during construction:

Pile-driving noise during construction work can scare fish away from a large area. The noise modelling has not identified the area where fish behaviour will change. The area is expected to be much wider than the modelled TTS threshold. The noise modelling should also show results without attenuation measures, as attenuation techniques are limited in the open sea.

The Fisheries Authority estimates that noise will affect fish behaviour for tens of kilometres, but at least in the area of fishing grid 50G8. It is possible that fishing will be unprofitable throughout the construction period in the whole grid and beyond. If other offshore wind projects are built at the same time, most offshore fishing could cease for several years, which could mean the closure of the entire industry. Monitoring will be needed to determine the impact of the project. To reduce cumulative impacts, the permitting authority will need to coordinate the timing of projects through its decisions.

Impact of the location of the Olof Skötkonung offshore wind farm on Finnish fisheries

In accordance with Article 5(1) of Regulation EU 1380/2013 of the European Parliament and of the Council, Finnish fishing vessels have equal fishing rights in the Swedish EEZ, the international waters where the planned wind farm is located. Finnish fishing vessels are well established, and it is impossible to move fixed trawl passages. The herring quota (TAC) of Gulf of Bothnia is shared between Finland and Sweden, of which approximately 82% is allocated to Finland.

The Baltic herring is a species subject to quota and the amount of fish caught is based on scientific information. Quotas ensure that stocks remain viable, that fishing is sustainable, and that the fishing industry is safeguarded in the long term.

The Bothnian Sea is Finland's most important fishing area, and a large part of the Baltic herring intended for human consumption caught in the Finnish quota comes from the Swedish EEZ. Catches from the Bothnian Sea play a key role in Finland's fisheries. Finnish vessels have



fished regularly in the area for at least 30 years. The areas around the project area are very important fishing grounds for the Finnish herring fishery.

The project area is partly located on two trawl grounds, the eastern one of which is particularly important for the viability of the trawler fleet. If the trawl corridors within the trawl areas were to be cut off in the project area, fishing would also cease outside the project area, either in part or whole corridor. If the project goes ahead as proposed, most of the catches in ICES area 50G8 will be permanently lost, about 10% of Finland's annual catch in the Bothnian Sea.

It is probably impossible to compensate for the catches by fishing elsewhere, at least not with the same efficiency. Catches in the area are important for food production. The fishing grounds in the project area are at times the only ones where fishing can be carried out even with strong south-westerly and southerly winds, thus ensuring the continued availability of fish for the Finnish food industry.

The project does not contribute to sustainable fisheries, as the application as submitted poses a major risk to Finland's emergency supply and the degree of domesticity of Finnish fisheries.

The risks to fisheries are cumulative, as there are a total of 8 offshore wind farm projects pending in the international waters of the Bothnian Sea, of which at least 4 will have a significant impact on trawling. If these were implemented, the Baltic herring fishery would be concentrated on larger trawlers and fishmeal production.

The applicant estimates that large-scale trawling will cease in the project area, which is unacceptable in the view of the Fisheries Authority, but other fisheries may continue. There are no other fisheries than trawling in the project area. In practice, the project will stop fishing in the project area altogether.

The Natural Resources Institute Finland (Luke) has carried out a comprehensive survey of the fishing grounds of the Finnish trawl fleet in the Baltic Sea (Lappalainen et al. 2023). The review also includes similar data on Swedish trawlers in the Gulf of Bothnia from 2018 to 2022. The report is presented in the annex to this opinion. Unfortunately, the text of the report is only available in Finnish, but the executive summary has been translated into Swedish.

The impact of the project on the stock management

If the project goes ahead as planned, the impact on fisheries will be significant. The applicant considers that the reduction in fishing is good for fish stocks, fisheries and species conservation. It is not so clear; it should be noted that preventing fishing in the area will only benefit fish stocks if it reduces the fishing mortality of the target stock or of certain age classes or food items. A reduction in the catch area does not automatically reduce fishing. The quota system allows fish to be caught elsewhere. Fishing may intensify or shift to less productive areas, resulting in reduced ecological and economic sustainability.

The herring fishery in the Gulf of Bothnia is regulated by European Commission decisions based on scientific advice from ICES. In addition, the Swedish and Finnish governments have started to work together to protect the Baltic herring stock in the Gulf of Bothnia. The Fisheries Authority considers that the herring fishery should be regulated by a fishing quota, not by excluding fishing areas through hydro-engineering projects.

The applicant estimates that the reef effect could even have a positive impact on fisheries. This is unlikely, as the fisheries impact of the reef effect is based on species that do not occur or are rare in the Bothnian Sea.



The report stresses the importance of cod (*Gadus morhua*). Cod is quite rare in the Bothnian Sea and is rarely fished. The reasons for the decline of cod are related to the declining salinity of the Baltic Sea and reproduction problems in the main basin of the Baltic Sea - rather than a lack of suitable habitat.

Requirements of the Fisheries Authority of the ELY Centre of Southwest Finland:

1. The project should not be authorised because of the adverse effects and damage it would cause to fisheries.
2. If the project is authorised,
 - 2.1. a 10 km wide buffer zone must be left between the Fingrunden lowlands and wind farm structures.
 - 2.2. The spawning of herring in Finngrunden shallows will be protected by not disturbing, preventing or destroying spawning in the same area in successive years. Schedules must be synchronised with neighbouring projects.
 - 2.3. No power plants, infrastructure, submarine cables or dumping of dredging material shall be built in the area reserved by law for fishing (riksintresset yrkesfiske) OR on the permanent trawl routes of EU fishing vessels and within the three-kilometre protection zone.
 - 2.4. The project must be subject to a fisheries monitoring obligation, which includes monitoring the reproduction of herring in the affected spawning areas, as well as the amount of fishing and catches. Monitoring must begin before work starts and continue uninterrupted until the wind farm is completed and for a further five years after completion during its operation. The results of the monitoring will be used to assess the fisheries impact of the project, and the amount of any economic damage caused.
 - 2.5. Any damage caused by the project must be compensated to the parties concerned without delay.

Annex: Fishing areas for the Finnish trawl fleet in the Baltic Sea in 2010-2022, Natural Resources Institute Luke, summary in English, the Swedish translation is attached to the original statement

The report analyses the fishing areas of Finnish trawlers in the Baltic Sea based on catch data and VMS material from the years 2010-2022. The analysis also includes similar material for Swedish trawlers in the Bothnian Sea in the years 2018-2022. The main results are presented with the help of maps. The most valuable species are Baltic herring (*Clupea harengus membras*) and sprat (*Sprattus sprattus*) as a by-catch. For Finnish trawlers, the most important catch area in 2010-2022 has been the Bothnian Sea, but large amounts of herring and sprat have also been caught in the Gulf of Finland, the Central Basin and the Archipelago Sea. Finnish and Swedish trawlers fish partly in the same areas in the Bothnian Sea, but in recent years Finnish fishermen have accounted for more than three quarters of the area's trawl catch. In recent years, a quarter of the herring caught by Finnish vessels has been used for human consumption. The largest herring are filleted and sold for human consumption in Finland and smaller herring are sold frozen for export for human consumption. Most of the raw material for the fillet industry is fished in the Bothnian Sea within the Swedish economic zone in the vicinity of Finngrundet and Saltbanken. In the Gulf of Bothnia, there is also small-scale trawl fishing that focuses on spawning vendace (*Coregonus albula*), although there is also some herring. Most trawl fishing for vendace takes place on the Swedish side of the area at the far end of the Gulf



of Bothnia. In recent years (2018-2022), almost three quarters of the entire trawl catch of vendace from the Gulf of Bothnia has been caught there. On the Finnish side, trawl fishing for vendace has been focused on an area north of Karlö.

During 2010-2022, there have been significant changes in the operating environment of the pelagic trawl fishery and in the catch volumes. However, during the same period, there have been hardly any changes in trawl fishing areas. Some areas that have been recognised as providing good catches have established themselves as catch areas and are of utmost importance for trawling for herring and vendace. Typical of these areas is that the seabed is well known and suitable for trawling, and fish of a suitable size can be caught close to the bottom without the risk of trawl breakage.

In interviews with representatives of fishing companies, it has been assessed that it will not be possible to fish for Baltic herring in the offshore wind energy areas. Hauling large trawls requires a lot of space and the risk of the trawls hitting the cables was considered particularly high. The vessels and trawls used for trawling for vendace in the Gulf of Bothnia are considerably smaller and, at least in principle, trawling could also be successful within the wind power areas, but even in this case the cables were considered a risk.

Natural Resources Institute Finland (Luke)

The proposed wind farm would be almost adjacent to the Fingrundet Östra Banken Natura 2000 site to the south for about 15 km. A 2 km buffer zone is planned between the Natura site and the nearest turbines. Natural Resources Institute (Luke) believes that the buffer zone should be wider. This Natura 2000 area is likely to be one of the most important wintering areas for long-tailed ducks (*Clangula hyemalis*) in the Bothnian Sea, ice conditions permitting. At least in poor visibility conditions, there is a risk that flocks of long-tailed ducks (*Clangula hyemalis*) circling low in the area could collide with adjacent turbines. The Fyrskeppet wind farm is planned to the north and east of the same Natura 2000 site. If both projects were constructed as planned, the Natura 2000 site would be left in the middle of the wind farms, with only a clear route from the north-west. This is likely to significantly reduce the importance of the area, as a wintering area for long-tailed ducks (*Clangula hyemalis*). This issue has been completely left out from the assessment of potential synergies and should be included.

Other offshore wind projects are planned in the vicinity and the assessment of the combined effects should also pay more attention to geese migrating through the area and especially the endangered lesser black-backed gull (*Larus fuscus*).

Luke also draws attention to the fact that the importance of the shallows of the Natura 2000 site adjacent to the project area as a spawning area for Baltic herring (*Clupea harengus membras*) has not been properly investigated. At least during the construction, the impacts may also extend to the Natura 2000 site, and it is possible that the wind farm area could also later affect the formation and movements of Baltic herring spawning aggregations. No systematic data on Baltic herring spawning areas in the Gulf of Bothnia have been collected and they are not properly known. Spring-spawning Baltic herring are known to spawn widely along the coast and in the archipelago, but observations from the more southerly parts of the Baltic Sea suggest that the spawning grounds for autumn-spawning herring are shallows further out to sea. Apart from Fingrundet, there are only a few extensive outer shallows in the Bothnian Sea. There is no reliable information on this, but it is possible that these outer shallows are crucial areas for the (subpopulation of) autumn-spawning Baltic herring in the Gulf of Bothnia. Therefore, more attention should be paid here to the possible importance of Natura 2000 sites as spawning



areas for Baltic herring, but this has not been clarified. Luke considers that the EIA should be completed in this respect.

The Annex on transboundary impacts states that the establishment of several wind farms in an area can have positive cumulative effects, as areas where trawling is not possible act as protection zones for fish stocks. It is suggested that this could potentially contribute to the recovery of various fish species, such as cod (*Gadus morhua*) and Baltic herring, and have a long-term positive impact on the ecosystem and fish stocks, and thus on commercial fishing in the area. Luke considers the above argument to be implausible, as fishing for these species in the Baltic Sea is limited by area-specific catch quotas. Therefore, preventing fishing in a wind power area would probably only increase fishing pressure in other areas. Furthermore, the environmental impact assessments (this project and Fyrskeppet) have concluded that the areas are not significant fishing areas.

The Government of Åland

It is important that the development of offshore wind power in the Baltic Sea is planned jointly, particularly regarding Swedish, Ålandic and Finnish wind farms in the Bothnian Sea. It is important to jointly investigate all possible cumulative effects in cooperation, such as the effect of wind-wakes.

The wind farm is near the waters of Åland. Considering the precautionary principle, the Government of Åland is in favour of more studies that also include the possible effects that arise when wind farms are located close to each other and adjacent to other countries' water areas. The Government of Åland welcomes such an initiative with overall co-operation, either from Sweden, Finland or another country in the Baltic Sea.

An example of a cumulative effect that can occur comes from the wind wakes (decreasing winds) that can occur behind large wind farms. Under stable conditions (summer conditions), wind wakes can extend about 30 km behind a wind farm, whereby both salinity and temperature can be affected. Decreasing winds behind wind farms lead to decreased vertical mixing of the seawater. This is the case according to the modelling carried out by SMHI in 2024 (Hydrographic effects in Swedish waters of future offshore wind power scenarios, REPORT OCEANOGRAPHY No. 77, 2024).

The results of the modelling studies show that the most important long-term hydrographic changes in Swedish waters that may occur to varying degrees due to offshore wind power are:

- Increased salinity in Baltic Sea bottom waters
- Increased temperature in Baltic Sea bottom waters
- Shallow halocline (the boundary between the lower and higher salinity water masses).

In the documentation now sent out, in Appendix B2 of the consultation report, SMHI points out that wind turbines can affect air flow on the leeward side of the turbines, which changes currents and mixing in the surrounding sea surface layer, which in turn can affect biological life. This cumulative effect has not been investigated by Deep Wind Offshore in the EIA. They point out in section 14.15 that information is not available. The Government of Åland would like to point out that the SMHI report mentioned above is available and should be used as a basis for further work and co-operation.



Annex B8 of the consultation document states that ringed seals (*Pusa hispida*) require stable ice for reproduction and for the care of their pups. In the Åland Sea and the Archipelago Sea, several cases have been observed where ringed seals have given birth and nursed of their pups on land on islands in recent years. The species also has core areas within the Sea of Åland and the Archipelago Sea, which has not been considered at all in the background report. The ringed seal population in the Sea of Åland and the Archipelago Sea is considered a separate population with a decreasing trend in the number of individuals. Considering other observations on the mobility of the ringed seal, it is conceivable that individuals of the Åland part of the ringed seal population move within the area of Olof Skötkonung wind farm.

The appendix provides a good discussion of bats and wind power, which suggests that the establishment of wind turbines in an area so close to land and in the vicinity of established bat migration routes is likely to result in significant mortality of individuals of several bat species, especially when the wind turbines are established and operational, as they attract insects and arouse the bats' curiosity. Good methods to avoid bat mortality are currently lacking. In terms of bats, the establishment of wind power in the Olof Skötkonung area may have significant negative effects, therefore the conclusion in Annex B of the EIA for the project that the effects on bats are assessed to be insignificant cannot be considered entirely correct. The proposed measures may reduce the negative impacts to some extent.

According to the supporting material in Appendices B11 and B13, the establishment of a wind farm in the project area may pose obvious risks to several bird species. This receives limited attention in the EIA and the consequences for birds are assessed as small overall even though several species, such as long-tailed ducks (*Clangula hyemalis*) and Lesser Black-backed Gull (*Larus fuscus*), forage in the area or in its vicinity and may therefore be significantly affected by the establishment. It is also questionable why an establishment of this scale is planned in an area that is a known migratory route for several species, including small birds and the Taiga Bean Goose (*Anser fabalis fabalis*). Small birds also collide extensively with wind turbines, but this is not further elucidated in the EIA. Finally, the protection measures described in the EIA are limited and unspecified, it does not describe how to adapt detection equipment to different species of birds or how to adjust operation according to season and weather conditions.

Åland Environmental and Health Protection Authority (ÅMHM)

Distance to Åland and cumulative effects

Preparations are currently underway for an auction procedure for the establishment of offshore wind power in Åland's northern sea area, area identified in the Åland's maritime spatial plan as most suitable for wind power.

Åland Environmental and Health Protection Authority (ÅMHM) notes that the distance to Åland in the environmental impact assessment for the project is stated to be approximately 79 km to Geta municipality. In chapter 4.1 of the environmental impact assessment, the distance to Åland is stated as 74 km. This refers to the approximate distance to land, so-called mainland Åland. The distance to the Åland territorial waters, on the other hand, is only about 50 km, which also coincides with the development area for offshore wind farms in the north of Åland. At these distances there should be a risk of environmental impact and significant cumulative effects, which have not been considered and assessed in the environmental impact assessment.

If offshore wind power is established in the Olof Skötkonung project area and the offshore wind power is established north of Åland, cumulative effects will arise around most of the assessment



factors, but probably mainly on shipping, fish and fishing, and possibly on bats. Moreover, the impacts of wind wake effects are not considered in the EIA, but they may have an impact overall Bothnian Sea, especially in combination with wind power establishment near the Åland Islands. Weaker winds at the sea surface affect the hydrography of the sea, including sea temperature, sea ice, streams and stratification. For Olof Skötkonung, this may be particularly important as the park is planned directly south of the Finngrundens Natura 2000 site and may affect the nutrient pool in the water mass. The sea areas to the north and east of Olof Skötkonung are also important for fish and commercial fishing.

The environmental impact assessment

ÅMHM states that in terms of impact on birds, especially lesser black-backed gull (*Larus fuscus*), Olof Skötkonung will cause cumulative effects if the wind power project in the northern territorial waters of Åland is approved. Lesser black-backed gull colonies at Eggegrund, Svartfluttu and Blåbådan have been found to be frequently present around Åland foraging. The islands off Åland are known to be favourite for lesser black-backed gull, among other species, and some of the observed populations may therefore consist of individuals from the Swedish colonies mentioned above. According to the Heliaca report, wind farms can cause displacement and constitute a barrier effect and needs further studying. Other species requiring further investigation according Heliaca report include the razorbills (*Alca torda*), black guillemot (*Cepphus grylle*) and long-tailed duck (*Clangula hyemalis*).

In Chapter 8.1.3 there is a section on *environmental pollutants*. It discusses organic and inorganic environmental pollutants that may occur in the project area. However, no mention is made of the presence of radionuclides in the form of caesium-137, which was dispersed and deposited in the Gulf of Gävle after the Chernobyl disaster in 1986. The highest values are measured in Gävle Bay. With a half-life of 30 years, the caesium content has now halved, but it is bound in the sediments and can be released, suspended and redeposited in connection with dredging and cable laying. There is potential for spreading to the water column and food chain. This could have been addressed and risk assessed in the EIA.

On pages 163 and 164 of the EIA report, fires are discussed. Why is fire not listed as an environmental risk in Table 58? A fire in a wind turbine results in large releases of unwanted substances to air and water. The risk is likely to be greater than for allision.

Application form

ÅMHM notes that the application for permission is open and imprecise and it is not clear what is intended to be built in addition to offshore wind power to a certain maximum extent, 70 turbines. There are differences in practice between Sweden and Åland/Finland. In Sweden, permission is granted to construct offshore wind power and only when the "exploitation licence" is obtained is the project designed in detail. The difference with Åland/Finland is that the project is more detailed at the time of application, so that the application describes what is to be constructed, where it is to be constructed and how it is to be constructed and what environmental impact this has. For the Olof Skötkonung project, the authorities cannot assess the potential impact of sediment dispersion caused by dredging and hydraulic construction, as the extent of the dredging requirement is actually unknown. Depending on the type of sediment, foundation type and cable laying technique, dredging needs may amount to several million cubic metres. In the sediment dispersion modelling carried out, the jacket foundation type has been used, which mainly involves piling. If gravity foundations were to be used instead, the dredging requirement would increase considerably, and with-it sediment dispersion and probably the need for dumping sites for sediment.



The environmental impact assessment and its appendices emphasise the need for further studies, particularly for most bird species, for three to five years after the wind farm has been commissioned. If surveys later show that the activity has a major negative environmental impact on most protected species, is it possible that mitigation measures can be carried out without significantly impairing the purpose of the activity?

Need for coordination

Several projects are being planned in the Bothnian Sea. ÅMHM considers that the lack of coordination between these projects is problematic, among other things due to the risk of cumulative effects and an impact on the possibilities of implementing other projects. Coordinated cross-border planning would be desirable the establishment of offshore wind power in the Bothnian Sea to be implemented in the best possible way.

Finnish Association of Professional Fishermen (SAKL)

Finnish Association of Professional Fishermen (SAKL) reiterates its concern about the impact of the project on the Baltic herring stock (*Clupea harengus membras*), for example, underwater noise and turbidity. The importance of the Natura 2000 site/Finngrundén as a spawning area for Baltic herring has not been sufficiently investigated, see also comments on this from the Natural Resources Institute Finland where the issue is further elaborated. If the herring stock is affected, the effects are clearly transboundary.

The impact of the various projects on migratory fish, especially salmon (*Salmo salar*), has not been sufficiently investigated. More research is needed before licences can be granted.

Annex 26 Espoo states that the application area is adjacent to and overlaps an area used by both Swedish and Finnish pelagic commercial fisheries, both in the eastern and the western parts of the area, which in Sweden are of national interest for commercial fisheries. Other documents attached to the application state that trawling currently takes place both inside and outside the application area.

The south-western parts of the Bothnian Sea are important for Finnish commercial fishing and any restrictions on the use of well-documented fishing areas have negative consequences for fishing companies and for onshore processing companies.

The applicant describes fishing with the negatively charged term 'industrial fishing'. Finnish Association of Professional Fishermen notes that the catch in Finnish fisheries is used for several purposes: directly for human consumption, indirectly via fishmeal production in the fish farming industry and currently only to a small extent for animal feed.

The Finnish Association of Professional Fishermen strongly objects to the applicant's clearly politically coloured description of the impact of trawling on Baltic herring stocks. The Natural Resources Institute Finland also notes that the applicant's claims in this regard are unlikely.

The Finnish Association of Professional Fishermen points out that Swedish and Finnish trawl fishing in the Gulf of Bothnia takes place entirely within the quotas set by the EU based on annual ICES advice. In addition, fishing is regulated by further technical provisions and restrictions. The applicant's descriptions of the quotas for Baltic herring fishing are also not in line with the current situation. The herring quota in ICES sub-areas 30-31 increased for 2025 by 31 per cent.



We would like to further emphasise that the licensing authority should take into account the possible cumulative effects which offshore wind industrial sites may have since a large number of wind power in the Bothnian Sea are currently planned in Sweden, Finland and Åland and especially around Finngrunden (Fyrskeppet, Olof Skökonung, Najaderna and Gävle East).

Sweden is also establishing a marine protected area (MPA) at Finngrunden, in the immediate vicinity of the currently planned industrial area. The Finnish Association of Professional Fishermen finds it conspicuous that large industrial areas for offshore wind power are planned in the vicinity of the MPA.

The Finnish Association of Professional Fishermen will submit the requested statement to the County Administrative Board of Uppsala County by 5 March 2025 regarding the permit application for the said area.

The Finnish Association of Professional Fishermen considers that the applicant should fully compensate the temporary and permanent losses caused by the project to fishery operators in both Sweden and Finland.

Finnish – Swedish Transboundary River Commission has given the statement both in Finnish and Swedish.

Although the project is not located within the geographical area of Transboundary River Agreement between Sweden and Finland (91/2010), the project may have an impact on the Torne River through effects on migratory fish. Salmon (*Salmo salar*) in the Torne River migrate as far south as the Baltic Sea, so they will potentially pass over the project area or the submarine cables carrying the generated electricity to the coast. Purpose of the Transboundary River Agreement is to pay particular attention to the conservation and sustainable use of fish stocks (Article 2.2.d).

Potential effects on migratory fish and cumulative effects

At the time of writing, there is still limited information on the potential impacts of offshore wind on migratory fish stocks. Given the large amount of offshore wind power planned for the Baltic Sea and the Gulf of Bothnia, the Finnish – Swedish Transboundary River Commission considers it important to act in accordance with the precautionary principle and to thoroughly investigate the potential combined and cumulative effects of all planned wind power projects on migratory fish stocks throughout the Baltic Sea. With reference to Article 66 (paragraph 1) of the UN Convention on the Law of the Sea, the Commission notes that "*States in whose rivers anadromous stocks originate shall have the primary interest in and responsibility for such stocks.*" Finland and Sweden, as states of origin within the meaning of the Convention on the Law of the Sea, must ensure that the construction or production of offshore wind energy does not have adverse effects on salmon stocks in the River Torne- River Kalix. The construction may therefore also have transboundary effects, which must be considered in the impact assessment.

Knowledge gaps on salmon (*Salmo salar*) migration

Annex B7 - Studies on the Olof Skötkonung fish community are described as follows:

"Salmon migrate north along the coast (Siira et al., 2009) and trout migrate throughout the Baltic Sea, the majority remain close to the coast (Thorstad et al., 2016). As the potential access route



is not the main migration route for salmon and trout, it is not considered equally important to take into account in a wind farm area."

The Commission notes that information on salmon migration is still limited. The available information on spawning migration is based on catch data, i.e. information on where salmon are caught. This information does not indicate which other areas are used by salmon during their migration or, conversely, which areas are not used by salmon.

Even less information is available on smolt migration. In the absence of sufficient data, the Commission stresses that more comprehensive information on the migration patterns of migratory fish is needed to assess the potential impacts.

Reliable information on salmon migration in relation to the project area could be obtained, for example, by placing acoustic receivers around the project area to collect observations of salmon tagged with acoustic transmitters. Such a survey would support the identification of migration patterns for both foraging and spawning salmon. In the absence of more detailed information on salmon migration in relation to the project area prior to project implementation, it is difficult to assess the potential effects of the project on salmon migration behaviour.

The Federation of Finnish Fisheries Associations

The project area is close to the Natura 2000 site Finngrundet and the area is partly within a commercial fishing area, where Finnish fishing also takes place. There are several other planned project areas in the vicinity of the Olof Skötkonung wind farm, some of which have been subject to consultation in Finland (Sylen, Najaderna, Fyrskeppet and Eyrasalt). In our statement, we take a position on fish and emphasise our concerns about cumulative effects.

Attitudes towards the fishing industry

The project developer notes that after the planned wind farm is established, trawl fishing will be restricted in the area, but that trawl fishing can continue in other sea areas outside the application area. It is also estimated that fishing with passive methods can continue if safety distances to the wind turbines are maintained. Restrictions on trawling may result in fishing vessels travelling further to other fishing areas or in increased competition for remaining fishing areas. It is also emphasised that the wind farm could have a positive impact in the long term, as fish stocks within the wind farm could recover as trawling will not be possible.

We find this to be a patronising way of dealing with commercial fishing in the area. Baltic herring fishing is regulated by EU decisions and quotas set on the basis of scientific advice from ICES. Baltic herring fishing should be regulated by fishing quotas, not by delimiting fishing areas through hydraulic engineering projects. The project developer simultaneously overlooks that the outcome of its own activities for the Baltic herring stock and thus also the conditions for fishing contain considerable uncertainties.

Complements are needed

We believe that the material does not take sufficient account of the Natura 2000 sites adjacent to the project area. There are relatively few such sites and their importance for Baltic herring spawning is not known. This should be better analysed.

In statements regarding similar projects, we have also emphasised our concern that, in addition to more regional effects on fish and fish spawning, migratory fish are also affected. In particular, salmon (*Salmo salar*) that migrates between foraging areas in the southern Baltic Sea up to the



rivers in the north and which will be greatly affected by all the offshore wind power development taking place in the Baltic Sea. Successive wind farms and associated cabling can disrupt salmon migration in the sea and delay migration to spawning rivers. The problem here is the emphasis on the word may. At present, there is too little data on the impact of offshore wind power on fish stocks, and this information is not available in the developer's material.

Cumulative effects

On the Finnish side of the Bothnian Sea and the Gulf of Bothnia, a major expansion of offshore wind power is also planned. In addition to the local impacts on fish stocks and fishing opportunities, we are concerned about the combined and cumulative impacts of the Swedish and Finnish wind power projects. The authorisation processes do not consider the aggregate and cumulative impacts of all projects under planning, unless one considers the project developer's estimate that several wind power areas may have a positive outcome for fish in the long run when fishing is made more difficult.

We believe that there is a need for more coordination and analysis of the cumulative impact of offshore wind projects in Sweden and Finland, before moving to authorise individual projects. Where individual measures may have a limited impact, the combined effect of several projects can cause significant and irreversible damage to fish stocks and the fishing industry.

Financial compensation

We would like to emphasise that it is important to consider and plan in good time how negative impacts on the environment and fisheries are to be compensated. It is important that compensatory measures are taken to ensure that the economic impact of the project does not unfairly penalise commercial fisheries. Sufficiently comprehensive and long-term monitoring is a prerequisite to ensure a fair and transparent assessment of the project's long-term impacts and the level of financial compensation. Part of the compensation should also go to research to fill the knowledge gaps we currently have on the impact of offshore wind farms on the environment and fisheries.

The Regional Council of Lapland

The Regional Council of Lapland notes that the section on transboundary impacts in the consultation documents was very limited and made it difficult to understand the basis for the assessment of transboundary impacts.

The Regional Council of Lapland wishes to draw attention to the potential impact on the Torne River salmon (*Salmo salar*). The Regional Council of Lapland asks that it would be noted that the Torne River salmon is of great cultural, ecological and economic importance in the Torne River valley and the Bothnian Sea as well as wider Baltic Sea. It is estimated that the Thorne River salmon would migrate as far as the southern Baltic Sea to forage. If the offshore wind project, alone or in combination with other offshore wind projects, has an impact on the migrating salmon in the Torne River, this would be a transboundary impact. This impact has not been considered in the consultation documents.

The Regional Council of Lapland would welcome if the environmental impact assessment procedure were to include cumulative cross-border impacts of offshore wind projects developed in the common maritime area of Finland and Sweden. In addition to the offshore wind energy area, the assessment of cumulative impacts should also consider power transmission solutions, the environmental impacts of which are still poorly known.



Regional Council of Satakunta

The Regional Council of Satakunta would consider the Finnish Maritime Plan 2030, adopted at the end of 2020, in the EIA process for the Olof Skötkonung offshore wind project. The Finnish Marine Spatial Plan 2030 does not set aside areas for offshore wind energy production but identifies potential areas for offshore wind energy 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. Work has started on updating the Finnish Marine Spatial Plan 2030, with the aim that the regional associations along Finland's coastline will prepare a new Marine Spatial Plan by the end of 2026. The update is driven by the many changes in the marine environment since the first plan was drawn up and by the many national and EU-level agreements and targets that pose new challenges to the sectors and the planning process. These include the 30% marine protected area target set by the Biodiversity Strategy, the growth targets for the fishing industry under the Inland Fish Promotion Programme, the development of offshore wind, overall security issues and the changing needs of maritime transport.

The planning of offshore wind power in the Gulf of Bothnia and the Bothnian Sea has increased significantly in recent years. In the update of the Swedish Marine Spatial Plan (<https://www.havochvatten.se/planering-forvaltning-och-samverkan/havsplanering/granskning-av-forslag-till-andrade-havsplaner/forslag-till-andrade-havsplaner.html>), several new large-scale offshore wind farms are potentially planned for the Bothnian Sea. As offshore wind power has implications for other uses of the sea and for important livelihoods in the Bothnian Sea, such as shipping and fishing, the environment and nature ecosystems, is the need for coordination on project planning obvious throughout the Gulf of Bothnia. Offshore wind energy transfer also has an impact on the onshore environment, ecosystems and land use. To support a well-managed development and to assess the overall impacts, cooperation between countries needs to be further intensified.

The Olof Skötkonung project area is far from the Finnish coast, but it is still important that the EIA process for offshore wind projects also considers the potential impacts on the Finnish maritime area. The EIA has therefore addressed transboundary impacts. The EIA concludes that the Olof Skötkonung project will have essentially no impact. Although the individual projects are not considered to have a significant transboundary impact, it is important that the impacts are considered, and that the assessment considers the potential cumulative effects of several projects.

The Regional Council of Satakunta stresses the importance of an open, interactive and sufficiently broad assessment process for large-scale offshore wind projects. Impact assessment plays a key role in the planning of projects in the Bothnian Sea. Impacts that extend beyond the project area alone, and which must be examined and considered in the planning of projects, include the effects on birds, fisheries and fishing industries. The Gulf of Bothnia is an important migration route for birds and the state of fish stocks affects the entire Bothnian Sea and the Gulf of Bothnia. In addition to the above, the impact assessment should pay particular attention to shipping and consider the varying ice conditions in the Bothnian Sea.

Finnish Transport and Communications Agency Traficom

Large offshore wind farms, and especially offshore wind farms located near each other, can have a significant impact on shipping in the Gulf of Bothnia, both from the point of view of safety and the operating conditions of shipping.



Where offshore wind farms are located close to shipping lanes or shipping areas, wind turbines can cause interference with radar, radio and positioning systems on ships, or pose a risk to maritime safety, as well as hampering shipping conditions, especially during ice-covered periods.

The proposed Olof Skötkonung offshore wind farm and several other offshore wind farm plans in its vicinity are located close to the most important maritime traffic areas in the Bothnian Sea. The Olof Skötkonung offshore wind farm, together with other offshore wind projects planned for the Bothnian Sea, would, if built, concentrate shipping in the Bothnian Sea in narrower shipping lanes than at present, increasing the risks of, inter alia, ship collisions and oil spills. These risk factors could also have transboundary effects.

In the Finnish version of the project's EIA, the effects of the offshore wind farm on shipping are briefly and very superficially described. Traficom considers that a more comprehensive and analytical assessment of the impacts on shipping would have been justified, both in the project area and regarding the offshore wind projects in the Bothnian Sea, by also considering the projects planned for the Finnish EEZ in order to obtain a more realistic overall picture.

To coordinate different land uses in a sustainable manner on the scale of the entire Bothnian Sea, more comprehensive cross-border coordination between authorities would be required between projects, as the impacts of offshore wind projects are reflected in wider areas than individual project sites. Existing the permitting and clearance process for offshore wind projects focuses mainly on the estimated impacts of individual projects, making it challenging to achieve controlled coordination between different areas and to assess overall impacts.

If the project progresses to the construction phase, the further design and during the construction phase, it would be important to identify and assess the impact of offshore wind farms on maritime radar, radio and satellite positioning equipment/systems, and to carry out field tests to determine the impact of the wind farm, so that any mitigation measures maritime radar, radio and satellite positioning equipment/systems can be implemented in a timely manner. Impacts should be assessed not only for vessels in the operational areas, but also in exceptional situations where vessels have drifted close to an offshore wind farm area or into an offshore wind farm area.

Finnish Meteorological Institute

As in the previous opinion (318/03.00.02/2022), the Finnish Meteorological Institute has no comments on the weather radar network, as the site is more than 20 km from the nearest weather radar. As regards marine research, the Finnish Meteorological Institute considers that the wind farm will have an impact on the monitoring of the state of the sea (a statutory task of the Finnish Meteorological Institute), and in particular on the use of free drifting floats (such as Argo floats) in the Bothnian Sea. The Finnish Meteorological Institute considers that the project developer should, together with other actors (such as SMHI and the Finnish Meteorological Institute), investigate the possibility of substitute measurements in the area of the wind farm to ensure that measurements important for monitoring the state of the sea will continue during the construction of the park.

Ministry of Defense, Finnish Border Guard, Centre for Economic Development, Transport and the Environment of North Ostrobothnia, Finnish Safety and Chemicals Agency (Tukes), The Finnish Heritage Agency and Regional Council of Southwest Finland did not have any comments on the matter.



Conclusions

The statements received during the consultation focused mainly on biological effects, fish stocks and fisheries, ringed seal (*Pusa hispida*) and impact on wind and hydrodynamic conditions. They also addressed maritime traffic and the combined effects of different offshore windfarm projects.

The EIA lacks modelling of the hydrodynamic and wake effects of the project, making it difficult to reliably estimate the environmental impacts. Fish stock surveys in the area are also inadequate, and spawning grounds for Baltic herring (*Clupea harengus membras*) have not been identified. Baltic herring spawning grounds should be studied in more detail using appropriate methods. The impact on migrating salmon (*Salmo salar*) should also be assessed in more detail. The impacts on trawling are underestimated, since trawling in the area will become impossible. The Finnish Environment Institute recalls that it has already been stated in the consultation on the EIA programme that the impact on fish populations and commercial fishing should be adequately assessed in the EIA documentation and in cooperation with both Finnish and Swedish fishing industry operators. When it comes to ringed seal (*Pusa hispida*), it is not mentioned in the report of the project that the species also has important habitat areas within the Sea of Åland and the Archipelago Sea.

The assessment of the combined and cumulative effects of different windfarm projects has been conducted, but it needs to be supplemented. The combined effects of the projects on wind conditions and sea currents, as well as on fishing and maritime traffic, should be assessed. Cumulative hydrodynamic impacts should also be assessed, as well as cumulative impacts on certain bird species mentioned in the statements. It should be noted that the report of the project does not take sufficient account of the Natura 2000 sites adjacent to the project area. The Fyrskeppet wind farm is also planned close to the Natura 2000 site. If both projects were constructed as planned, the Natura 2000 site would be left in the middle of the wind farms. This is likely to significantly reduce the importance of the area as a wintering area for long-tailed ducks (*Clangula hyemalis*). This issue has been completely left out from the assessment of potential cumulative effects and should be included. When it comes to Åland, it needs to be considered that the distance of the planned project area to the Ålandic waters is only 50km and the cumulative impacts of planned Finnish, Ålandic and Swedish wind farm parks will be unavoidable.

Based on the given statements and its own evaluation, the Finnish Environment Institute considers the EIA of the offshore windfarm Olof Skötkonung to be inadequate. The Finnish Environment Institute requires that the EIA needs to be supplemented according to the statements received. The statements received and enclosed to this letter should be analysed and responded to. Therefore, the Finnish Environment Institute wishes to continue the consultations under Article 5 of the Espoo Convention. The permitting process cannot be completed until the EIA report has been supplemented, and Finland's response has been analysed and responded to. Additionally, the negotiations under the Espoo Convention must be concluded before the permit granting.



Head of Services

Jenni Juslén

Senior Officer,
Point of Contact to the Espoo Convention

Hanne Rajanen

This document has been electronically signed. The electronic signatures can be verified from the register office of the Finnish Environment Institute.

Appendices

Received statements in Finland in Finnish or Swedish

For information

Ministry for Foreign Affairs
Ministry of the Environment
Centre for Economic Development, Transport and the Environment of South Ostrobothnia
Centre for Economic Development, Transport and the Environment of Southwest Finland
Centre for Economic Development, Transport and the Environment of Southwest Finland - Fisheries Authority
Natural Resources Institute Finland (Luke)
The Government of Åland
Åland Environmental and Health Protection Authority
Finnish Association of Professional Fishermen (SAKL)
Finnish – Swedish Transboundary River Commission
The Federation of Finnish Fisheries Associations
The Regional Council of Lapland
The Regional Council of Satakunta
Finnish Transport Infrastructure Agency
Finnish Meteorological Institute
Finnish Heritage Agency
Finnish Transport and Communications Agency Traficom
The Finnish Border Guard
Finnish Safety and Chemicals Agency (Tukes)
The Regional Council of Southwest Finland

