

Authority Services

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Reference: Polargrund Offshore, NV-06840-22; Mål nr M 1985-24.

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 wind farm and hydrogen plant "Polargrund Offshore" in Sweden's territorial waters and exclusive economic zone

The Finnish Environment Institute acknowledges that Finland has received the consultation request on 3 October 2024, in accordance with Articles 4 and 5 of the Espoo Convention and the related consultation documents from Sweden. This consultation request was made before the Finnish Environment Institute had responded the supplementary notification regarding the same project according to Art. 3, dated on 28 August 2024. The Finnish Environment Institute submitted the response to the supplementary notification on 8 October 2024.

Originally, the notification concerning the project was dated 12 July 2022, and as a response to the notification the Finnish Ministry of Environment replied on the 30 September 2022 in accordance with Article 3(3) of the Espoo Convention that Finland intends to participate in the EIA procedure of the planned Polargrund Offshore project.

In its notification to Finnish Ministry of Environment on 1 October 2024 (Mål nr M 1985-24), the Umeå District Court considers that the Nordic Environmental Protection Convention (Treaty Series 74-75/1976) applies to the Polargrund Offshore project. The Finnish Ministry of Environment also considers that the Project should be dealt with in the manner required by the Nordic Convention on Environmental Protection, regarding the obligations to provide information and to carry out the necessary investigations referred to in Article 7 of the Convention. The competent authorities regarding the Polargrund Offshore project in Finland, the ELY Centre of Lapland and the ELY Centre of North Ostrobothnia, did not consider it necessary to organise a separate consultation in their area of competence. Their statements are attached to this letter.



Consultation in Finland

According to the 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 potential additional statements concerning the scope of the assessment of the environmental impacts of the project in Finland, and comments from the public in Finland. The public and the authorities were given the opportunity to comment on the consultation documents from 11 October to 19 November 2024, which was available on the website of Finland's environmental administration and on the website of lausuntopalvelu.fi. Statements were also asked from relevant stakeholders. The Finnish Environment Institute received sixteen (16) statements.

The Finnish Environment Institute has prepared a summary of the original statements in English below. However, the original statements which are enclosed to this letter, include important and detailed remarks which need to be taken into consideration in its entirety.

Statements received in Finland

Lapland ELY-Centre

Request for advice 11.10.2024 (SYKE/2024/1653), Mål nr M 1985-24.

Environmental impact assessment report and permit applications for the Polargrund Offshore wind farm, Naturvårdsverket, Sweden

Case management

The Finnish Environment Institute (SYKE) requests the opinion of the Centre for Economic Affairs, Transport and the Environment of Lapland (ELY Centre) on the Environmental Impact Assessment Report and the application for a permit for the Polargrund Offshore offshore wind farm and hydroelectric power plant in the Swedish EEZ.

The Swedish Environmental Authority Naturvårdsverket announced the start of the environmental impact assessment procedure in August 2022. The ELY Centre of Lapland commented on the matter on 22 September 2022 and proposed that Finland should participate in the environmental impact assessment procedure for the Swedish Polargrund Offshore wind farm. In its opinion on the EIA programme, the ELY Centre has also asked to take into account what has been said regarding the environmental impacts on Finland. In September 2022, the Finnish Ministry of the Environment responded that Finland would participate in the EIA procedure for the Polargrund Offshore project. On 30 September 2024, the Lapland ELY Centre also commented to the Finnish Environment Institute on the supplementary notification and request for comments regarding the change in the size of the project area, which was reduced by approximately 20%, changes in the planned hydrogen production and impacts related to seabed investigations.

On 29 October 2024 (VN/28187/2024/YM-3), the Ministry of the Environment transferred to the Lapland ELY Centre the processing of the document (notification) concerning the application for a permit for the Polargrund Offshore offshore wind power project, which it received from the Umeå District Court on 1 October 2024. The Lapland ELY Centre acts as the supervisory



authority for environmental permits issued by the state licensing authority in its territory (Lapland County). As the permit application documents are also included in the Espoo Agreement consultation documents, the ELY Centre of Lapland does not issue a separate opinion on the permit case but considers that this opinion should also be taken into account when deciding on the permit case.

In its notification, the Umeå District Court considers that the Nordic Environmental Protection Convention (Treaty Series 74-75/1976) applies to the project. The Finnish Ministry of the Environment also considers that the matter should be dealt with in the manner required by the Nordic Convention on Environmental Protection, regarding the obligations concerning information and the necessary impact assessment referred to in Article 7 of the Convention. As the competent authority in this case, the ELY Centre of Lapland states that the above-mentioned information obligations have been adequately taken into account in the consultation under the Espoo Convention and does not consider it necessary to organise a separate consultation in its area of competence. Furthermore, the ELY Centre of Lapland considers that the obligation to carry out an adequate impact assessment in accordance with the same article has been fulfilled in its area of competence as a result of this opinion.

The project

According to the request for comments, the project developer Skyborn Renewables is studying the possibility of establishing offshore wind and hydroelectric power generation in the Swedish Exclusive Economic Zone (SEZ) and the territorial waters of the Bothnian Bay at the Polargrund Offshore wind farm. Up to 120 wind turbines with a maximum height of 350 metres above mean sea level are planned. The total area of the project site is about 341 km² with an average depth of about 45 metres. The offshore wind farm project is planned to generate either 10 TWh of electricity or 200 000 tonnes of hydrogen per year through decentralised hydrogen production, i.e. separately in each wind turbine. The project includes a cable or pipeline network within the park. The environmental impact of transmitting the wind-generated electricity onshore via cables to the Swedish electricity grid or using the electricity to produce hydrogen in the park and transmitting the hydrogen onshore via pipelines will be assessed in a subsequent permit application.

The project area of the Polargrund Offshore wind farm borders the Finnish Exclusive Economic Zone and is located about 50 kilometres from Tornio and Kemi and about 70 kilometres from Oulu. The project area is located also 23 kilometres from the Perämeri National Park and 24 kilometres from the Merikalla Natura 2000 site.

Options

According to the EIA report, the environmental impact of the transmission of electricity generated by wind power to the Swedish electricity grid via cables on land or the use of electricity to produce hydrogen in the wind farm and the transmission of hydrogen to land via pipelines will be assessed later in a separate permit application. The ELY Centre of Lapland states that the assessment of alternatives is an essential part of the environmental impact assessment.

The options allow you to identify the impacts of different implementation options. The comparison of the options makes it possible to identify the least harmful options for the project. The ELY Centre of Lapland states that electric cables and hydrogen pipelines have different



impacts on the marine environment, especially on migratory fish. The proposed impact assessment has a significant shortcoming in this respect, as the effects of electricity transmission are different from those of hydrogen transmission. This omission also means that mitigation measures could not be fully taken into account in the design.

Environmental impacts on Finland

The EIA report states that the project may have the following impacts on the Finnish side: underwater noise impacts on fish, marine mammals and commercial fishing, increased turbidity and sediment deposition (bottom-dwelling organisms and fish), visual impacts (landscape) and risks to maritime traffic, which will be blocked in the project area. All these impacts are considered by the EIA report to be of minor importance.

Fisheries and fisheries

The Lapland ELY Centre states first of all that the Environmental Impact Assessment for the Polargrund Offshore offshore wind farm is clear, logical and, for the most part, quite comprehensive. The effects of the dredging spoil disposal (section 13.4 of the EIA) on fish and fisheries have not been examined, which must be considered a shortcoming.

The baseline status of the fish in the project area has been determined by exploratory net fishing and eDNA surveys. Species of fisheries importance were observed in salmon, whitefish/vendace, herring, sea trout and lamprey, among others. The ELY Centre of Lapland states that the experimental net fishery is poorly suited to open sea conditions. The open sea conditions of the experimental net fishery and the eDNA study do not provide information on the biomass of the fish stock in the project area or on the abundance ratios of fish species. eDNA has uncertainties, such as how long DNA from fish remains in the water and how far the detected DNA may have travelled in the water. On the other hand, the eDNA study could not distinguish between all fish species, such as whitefish and vendace. A more appropriate study to estimate the biomass and density of fish species in the offshore project area would have been an echosounding survey supported by fish sampling.

Regarding the eDNA studies carried out in June, it is unclear whether the salmon DNA detected in the project area originates from female fish on their way to rivers during spawning migration or from migratory juveniles that left the river on their sea journey. It is therefore not possible to assess the significance of the project area for adult salmon and migrating juveniles. On the other hand, with regard to eDNA sampling, it remains unclear how the timing of sampling compares to the above-mentioned peak spawning periods for adult salmon or migratory juveniles. Presumably, salmon presence in the project area and detectable eDNA is most abundant during peak migration. In any case, the results of the eDNA survey suggest that the project area is important for salmon.

Regarding the status of the salmon population in the Tornionjoki River, the Lapland ELY Centre points out that the number of spawning salmon that have entered the Tornionjoki River has decreased sharply since 2022. In 2023, the number of rising salmon was down to around 20 000 salmon and in 2024 to around 24 000 salmon. Weak salmon spawning runs are estimated to lead to a reduction in the production of migratory smolts and below the target level of sustainable (maximum sustainable yield (MSY)) for the salmon stock in the river. The situation of salmon stocks in other rivers in the Bothnian Bay area is also worrying and all measures that have a negative impact on salmon survival must be critically examined.



The surveys showed that whitefish were present in the project area at both times surveyed. For whitefish, the identification of the species of whitefish caught in the test net fisheries (seaspawning lesser sparsely-rakered whitefish/anadromous whitefish) would have clarified the assessment of the importance of the project area for the different species of whitefish. The survey indicates that whitefish are present in the project area, but the importance of the area for the different species of whitefish and the different life stages of whitefish remains unclear.

Lamprey DNA was detected in the project area, especially in September. It is likely that the detected lamprey DNA originates from European river lamprey (*Lampetra fluviatilis*), whose spawning migration in the Baltic Sea takes place in autumn, starting around mid-August. Thus, the project area may be of importance at least as a spawning ground for the lamprey.

The ELY Centre of Lapland states that the eDNA survey also indicates that sea trout are present in the area. The project area may be important as a feeding area for sea trout.

Shortcomings in the environmental impact assessment for fisheries

As regards the environmental impact assessment of the project, a clear shortcoming is that the impact of dredging on fish and fisheries has not been assessed at all. The location of the dredging spoil disposal area and the spreading of the sediment to be dumped in the waterbodies will largely determine the impact on fish and fisheries. Therefore, the location of the sediment dumping area and the impact of the disposal on fish and fisheries should be assessed in the context of the EIA.

The data presented for commercial fisheries are incomplete for Finland. Almost all of the catch of vendace in the marine area of the Finnish commercial fishery is caught in the Bothnian Bay. A significant part of the turnover of the commercial fisheries in the area is generated by the sale of the roe collected in the context of the vendace fishery. The estimate presented (Annex D15, Table 4.2.) of the monetary value of the catches from Finnish commercial fisheries does not include the value of the vendace roe. The fishing of vendace for the purpose of catching roe is an essential part of the coastal fishery in the Bothnian Sea, which also allows for smaller-scale coastal fishing. The Lapland ELY Centre states that the catch value of Finnish commercial fisheries that includes vendace roe is many times higher than the estimate in the report.

In the EIA procedure, the impact on fisheries has been assessed as largely negligible, except for the noise impact of construction and decommissioning, which has been assessed as minor. The ELY Centre of Lapland states that very little is known at present about the effects of offshore wind farms, for example on migratory fish.

Risks and uncertainties

The impact assessment has been based on the construction-related noise report (Annex D6), which is based on the permanent or temporary (TTS) injury to fish. However, fish can be disturbed, and avoidance behaviour can occur even at noise levels well below this. Thus, fish escapement may occur over a much wider area than currently estimated. In particular, the potential disturbance of fish migration behaviour by noise is a significant risk. Noise can slow down and disrupt the migration of migratory fish such as salmon. In addition, noise can interfere with spawning of herring and vendace, for example. For example, shallower marine areas to the north and north-west of the project area may contain herring and vendace spawning grounds.



In addition, there is uncertainty about the effects on fish of sludges resulting from dredging operations during construction and the effects of turbidity from dredged material dumping. The impact of dredging on fish and fisheries has not been assessed.

The effects of the wind farm's operation on the fish in the Bothnian Bay are not known. In particular, there are uncertainties related to the potential adverse effects on the behaviour of fish migratory species. Noise, electromagnetic radiation, lightning, thermal and salinity emissions from the wind farm can disturb the migration behaviour of salmon. Potential negative impacts may cause changes in salmon migration routes and delays in migration, for example, which may increase mortality or reduce reproductive success. Potential negative impacts may be cumulative if several wind farms are located on important salmon migration routes. Thus, the potential negative cumulative effects of different wind farms in the Bothnian Bay region on migratory fish should have been assessed.

The EIA report considers the risk of invasive species arriving to be low. The ELY Centre of Lapland states that the risk of invasive species is higher for offshore wind farms than for other forms of maritime transport. Adaptations to brackish water are quite typical of invasive alien aquatic species. The specialised vessels used for wind farm construction are likely to come from outside the Baltic Sea. Foundations or other structures of wind farms may also come from outside the Baltic Sea and encounter the aquatic environment outside of Baltic Sea during docking or transport. Such structures may be a more suitable platform for the settlement, survival and home habitation of various organisms than ordinary merchant vessels.

The submarine cable route to the mainland is an integral part of the overall impact of the wind farm. The cable routes will pass through shallower sea areas where the importance of electromagnetic radiation and the potential risk of negative impacts on migratory fish is increased.

The routes may also contain valuable breeding areas for vendace, herring and whitefish, among others. For example, digging cables into the seabed in shallow sea areas can destroy spawning areas suitable for these fish species. In addition, cable routes can restrict inshore fishing with trawls and fixed gear in cable corridors and near corridors. The construction of the submarine cable route may also have transboundary fishing impacts, which, in the opinion of the Lapland ELY Centre, should be assessed in the environmental impact assessment procedure in accordance with the Espoo Convention.

Impacts on water, aquatic ecosystems and marine management objectives

The Lapland ELY Centre states that, based on the consultation documents presented during the EIA procedure, the project may have at least the following impacts on the Finnish marine area: increased solids content and siltation of the bottom, as well as a possible increase in the concentration of hazardous and harmful substances in the water; noise, vibration and flicker during construction, operation and dismantling; and salt and heat pollution related to hydrogen production. These impacts may cause harm to benthic fauna, fish and marine mammals, among others. In its previous opinions, the ELY Centre has considered that the environmental impact assessment should examine the extent of the potential effects of the dredging and dumping activities in terms of their volume and location and their potential impact on the Finnish marine area.



The EIA report has in chapter 13.4 considered in general terms the dumping of the masses generated by the construction of the wind farm, which may amount to a maximum of up to 1 200 000 m³. However, the EIA report has not indicated the location of possible dumping areas, nor has it assessed the increase in turbidity and sediment deposition caused by dumping, which may have an impact on benthic fauna and bottom-dwelling fish. The ELY Centre of Lapland considers that the assessment of the potential impact on the Finnish territory of the dredging and sediment dumping activities is incomplete.

Birds and mammals

The ELY Centre of Lapland considers that the birds migrating and feeding in the project area have been surveyed to a more or less sufficient extent. The surveys have been reported in a largely appropriate manner and have provided information that is reasonably relevant to the preparation of the surveys. The findings of the surveys are clearly presented, although the survey report is only available in Swedish. Another shortcoming is that no information was available on the flight altitude of the birds observed and little on the location of bird migration in relation to the wind farm area. Another shortcoming is the inaccuracy of the maps in the EIA documents, which, especially from a Finnish perspective, are sometimes difficult to interpret, for example regarding the location of the monitoring sites. However, the impact assessment has illustrated the mechanisms of impact in an illustrative manner and the assessment has been carried out in a well-founded manner on this basis. Despite these shortcomings, the ELY Centre of Lapland agrees with the assessment that the effects on birds feeding in the project area or migrating through the area are not considered significant in Finland either.

The Lapland ELY Centre states that the project is not considered to have an impact on bat species in Finland due to the northern location of the project and its offshore location.

In the marine mammal survey, eDNA samples should also have been taken from Finland to confirm the results. In addition, the potential impact of changes in ice conditions on marine mammals has not been addressed at all in the impact assessment, although marine mammals have been recorded in the area of the planned wind farms during winter. Despite the shortcomings identified, the assessment of the impact on marine mammals is based on descriptions of the impact mechanisms that are otherwise sufficiently detailed. The ELY Centre of Lapland notes the importance of appropriate current status studies and the identification of all impact mechanisms in the impact assessment but considers that the project is unlikely to have a significant impact on marine mammal populations in Finland.

Natura 2000 sites and protected areas

The Natura 2000 network sites for Finland are presented in the annex to the EIA report, which is only available in Swedish, and no other protected areas are presented for Finland. The Lapland ELY Centre considers the above to be a shortcoming but considers the shortcoming to be minor due to the long distance between the project and the protected areas in the Finnish territory. The ELY Centre of Lapland considers that the project is not expected to have a significant impact on the natural values on which the protection of the Finnish protected areas is based, due to the long distances and the low number of birds migrating through the project area.

Environmental protection

The ELY Centre notes that the supplementary consultation document previously consulted in September 2024 had identified potential impacts on the Finnish EEZ. At that stage, sediment



contaminants and other characteristics, such as the presence of sulphide-rich sediments in the project area, had been investigated, but the ELY Centre considered it a shortcoming from an environmental protection perspective that the locations of power plants and suitable marine disposal areas were presented in general terms. The nearest potential sediment disposal site is less than 2 kilometres from the Finnish economic territory, which means that, in the ELY Centre's view, marine disposal of sediment could have a significant impact on the Finnish side. The ELY Centre considered that the assessment of sedimentation impacts should also take into account the construction of power plants and transformer stations, cabling and construction related to hydrogen production. If the measures are located close to the border of the Finnish economic territory, the effects on turbidity of water and silting may extend into the Finnish economic territory.

In the environmental impact assessment presented in the request for an opinion, the turbidity caused by excavation work during the construction of the offshore wind farm and the installation of the internal pipeline network has been shown by modelling to spread up to five kilometres outside the project area. However, the analysis of the sediment masses generated during construction (up to 1 200 000 m³) for sediment dumping remains very general. The EIA does not indicate the location of possible sediment disposal sites and therefore does not assess the increase in turbidity and sedimentation/silting caused by dumping activities. The ELY Centre of Lapland considers that the assessment of the potential impact on the Finnish territory of the sediment dumping remains incomplete.

Built cultural environment

In its statement to the Ministry of the Environment on 22 September 2022, the Lapland ELY Centre has stated regarding the possible impacts of the project on the built cultural environment that under suitable conditions it is possible that the nearest power plants in the planning area may be visible in the area of the Bothnian Bay National Park and the Selkä-Sarvi Island and/or Pensaskari Island, but the impact on the cultural environment values of the areas cannot be considered significant due to the distance of the planning area from sites with values.

In the EIA report of the offshore wind farm, the landscape impacts have only been assessed on the Selkä-Sarvi Island, which is designated as a nationally significant built cultural environment (RKY) as part of the site of the Perämeri fishing harbours and fishing bases. The actual cultural environment report prepared in support of the EIA procedure includes only the sites on the Swedish side, whereby the effects on the built heritage values of Selkä-Sarvi Island have been assessed by comparing the island with other islands within a similar distance zone. In addition, the landscape impacts on Selkä-Sarvi Island have been illustrated by one observation photo. In the EIA report, the landscape impacts on Selkä-Sarvi Island in the intermediate zone (25-50 km from the nearest power plant), such a barren island as Selkä-Saari Island, have been assessed as moderate, and on islands covered by vegetation generally as small or moderate.

The Lapland ELY Centre considers that the assessment of the transboundary impacts of the project on the built cultural environment presented in the EIA report is on the right track, although the impact assessment is based on a rather limited knowledge base.

Synergies

In previous statements, the Lapland ELY Centre has considered it important that the EIA procedure assesses the combined impact of the Polargrund Offshore wind farm project and



other offshore wind power projects, especially the Halla offshore wind power project, on the Finnish marine area and that the assessment also includes the impact on targets for marine environment management of the Marine Strategy Framework Directive.

The Lapland ELY Centre states that the EIA report does not consider the combined effects of the Polargrund Offshore wind farm project and other offshore wind projects planned for the Bothnian Bay. The ELY Centre of Lapland considers it important to assess the combined effects, especially regarding the impacts on migratory fish, fisheries, marine mammals and birds.

Monitoring

Chapter 14 of the EIA report gives a brief and general description of the monitoring during construction, operation and decommissioning of the project. It also states that a more detailed monitoring programme will be drawn up before the start of construction.

The monitoring programme for the construction phase will provisionally cover underwater noise and turbidity. According to the inventories carried out, there are no bats in the project area. To ensure that this remains the case after construction of the power plant, Skyborn will conduct a monitoring study of the presence of bats after the plant is operational as part of the monitoring program.

The ELY Centre of Lapland considers that the monitoring programme for the project should include monitoring of the impacts during both construction and operation, also for migratory fish (salmon) and marine mammals (seals).

General remarks on documents

The ELY Centre of Lapland draws attention to the quality of the Finnish versions of the EIA documents. The texts are sometimes difficult to understand, and the sentences contain a relatively high number of factual errors and incorrect terms, which can easily lead to misunderstandings, especially regarding the impact assessment. The ELY Centre of Lapland considers that a text produced by an expert should not only be translated using various translation programs but should also be checked for errors and corrected by an expert.

Taking account of the statement in the authorisation procedure

The Lapland ELY Centre requires that the above be taken into account in the environmental permit procedure for the Polargrund Offshore wind farm and hydrogen plant in Sweden.

The ELY Centre of North Ostrobothnia

Finnish Environment Institute's request for a statement 11.10.2024 (SYKE/2024/1653) and Umeå District Court's request for a statement 1.10.2024

Environmental impact assessment report and permit application for the Polargrund Offshore offshore wind farm and hydrogen plant in the Swedish EEZ

The Finnish Environment Institute (Syke) has received from the Swedish Environmental Protection Agency (Naturvårdsverket), in accordance with Articles 4 and 5 of the UN/ECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention 67/1997), the environmental impact assessment documents containing the assessment report and the permit application. According to the Act on Environmental Impact



Assessment Procedure (252/2017), the Finnish Environment Institute (Syke) is the competent authority for the Espoo Convention in Finland. Syke requests the opinion of the ELY Centre of North Ostrobothnia on the documents.

In July 2022, the Swedish Environmental Protection Agency (Naturvårdsverket) announced the start of the environmental impact assessment procedure for the Polargrund project. In September 2022, the Finnish Ministry of the Environment responded that Finland would participate in the environmental impact assessment procedure for the Polargrund project. On 21 September 2022, the ELY Centre of North Ostrobothnia submitted its comments on the consultation document to the Ministry of the Environment.

On 29 October 2024 (VN/28187/2024/YM-3), the Ministry of the Environment transferred the processing of the application for a permit (notification) for the Polargrund wind farm project to the ELY Centre of North Ostrobothnia, which it received from the Umeå District Court on 1 October 2024. The ELY Centre of North Ostrobothnia acts as the supervisory authority for environmental permits issued by the state licensing authorities in its territory (the province of North Ostrobothnia). As the permit application documents are also included in the consultation documents under the Espoo Convention, the ELY Centre of North Ostrobothnia does not issue a separate opinion on the permit case but considers that this opinion should also be taken into account when deciding on the permit case.

In its notification, the Umeå District Court considers that the Nordic Environmental Protection Convention (Treaty Series 74-75/1976) applies to the project. The Finnish Ministry of the Environment also considers that the matter should be dealt with in the manner required by the Nordic Convention on Environmental Protection, in particular regarding the obligations to provide information and to carry out the necessary investigations referred to in Article 7 of the Convention. As the competent authority in the matter, the ELY Centre of North Ostrobothnia states that the above-mentioned information obligations have been adequately addressed in the context of the consultation under the Espoo Convention and does not consider it necessary to organise a separate consultation in its area of competence. In addition, the ELY Centre of North Ostrobothnia considers that the obligation to carry out an adequate impact assessment under the same Article has been fulfilled in its area of competence by the present opinion.

Project

In the Polargrund project, developer Skyborn Renewables is exploring the possibility of establishing offshore wind farm and hydroelectric power plant in the Swedish Exclusive Economic Zone (SEZ) and the territorial waters of the Bothnian Bay. The project area borders on the Finnish economic zone and is located about 50 km from Tornio and Kemi and about 70 km from Oulu. The project area is also 23 km from the Bothnian Bay National Park and 24 km from the Merikalla Natura 2000 site. A total of 120 offshore wind turbines with a maximum total height of 350 metres and a maximum rotor diameter of 330 metres are planned to be built in the project area. The total capacity is estimated at 3000 MW. The project may require the use of specific foundation techniques depending on the quality of the seabed and the depth of the sea. Four offshore transformer stations are planned for the project area. The electricity will either be transmitted via overland cables to the Swedish national grid or converted into electricity either on the wind farm site or via pipelines installed on the seabed.



Quality of documents

The ELY Centre of North Ostrobothnia welcomes the fact that some documents have been translated into Finnish. However, the Finnish translations of the documents are sometimes of poor quality, which means that there are even factual errors and incorrect terms in sentences. This can easily lead to misunderstandings, particularly in relation to the impact assessment. For example, the Natura 2000 assessment lists bird species that do not exist. There are also lists of species where the same name is repeated several times in succession. For species names, Latin names should always be used in all reporting, in addition to the original language of the report, so that it is easy to confirm the correct species.

The ELY Centre states that a demanding text produced by an expert should not only be translated using various translation programs but should also be checked by an expert.

Project description

The project is largely adequately described. The foundations based on gravity may require excavation. The foundations will also be backfilled with material, which may be, for example, mineral aggregate. However, the assessment does not indicate where the material will be imported from and what the effects of transporting the material might be. The extraction of mineral aggregates will have an impact where it is extracted. The location of the landfill sites is also not indicated.

During the construction and maintenance phase, there will be shipping traffic to the area, but the routes are not described in detail.

The assessment does not give an idea of the overall impact of the project, as the electricity and possible hydrogen transmission of the project have not been assessed in this context. In Finland, it is common practice to assess the impacts of the different parts of the project in the EIA procedure. However, the effects of the electricity and hydrogen transmission are unlikely to extend beyond Finland, except at most in the long term through the combined effects.

The power output of the power plants in the project is only indicated in the noise modelling. The power output will only be determined during the detailed design of the construction phase. In the permitting procedures, it must be ensured that the noise impact is assessed at the dimensions of the power plant to be put into operation.

Description of the present state of the area affected by the project

The report shows the location of the project in relation to Swedish municipalities and urban areas (Figure 1-1). The map should have shown the municipalities and urban areas on the Finnish side also. Figures 10-11 and 10-13 should also have shown the protected areas on the Finnish side.

In the project baseline (Chapter 5.1), the Swedish Marine Spatial Plans have been used, not the Finnish Marine Spatial Plan 2030. Although the Finnish Marine Spatial Plan has no legal effect, it presents a synthesis and a target state for the development of the marine area that is based on extensive stakeholder cooperation.

No phased regional plans for North Ostrobothnia have been presented. For example, the legally established and master-planned Maa-nahkiainen offshore wind farm (Raahe and Pyhäjoki) (at a

distance of about 65 km) is missing. Although an amendment to the Maanahkiainen component master plan is pending, the legally valid component master plans allow the wind farm to be built.

Impacts on water, aquatic ecosystems and marine management objectives

Based on the EIA report, the project may have the following impacts on the Finnish side: underwater noise impacts on fish, marine mammals and commercial fishing, increased turbidity and sediment deposition. Sedimentation will have adverse effects on benthic fauna and fish. All these impacts are estimated in the EIA report to be of minor importance.

Section 13.4 of the EIA report provides a general overview of the dumping of the masses resulting from the construction of the wind turbine, which may amount to a maximum of up to 1 200 000 m³. However, the EIA report does not indicate the location of the possible sediment dumping areas and the impacts of dumping on biota are only considered at a general level. Depending on the disposal sites, marine disposal may have transboundary impacts on the Finnish side. On page 67 of the report, it is mentioned that modelling shows that turbidity can spread up to 5 km outside the project area. There may be impacts on benthic biota, to fisheries and fishing, as stated in the assessment, but the significance of the impacts is difficult to assess.

More information on the migration routes of fish, especially smolts (fry of *Salmo salar*), and their uncertainty would have been welcome. The effects of the wind farm on the fish in the area during its operation in the conditions of the Bothnian Bay are not known. Uncertainties relate to potential adverse effects on the behaviour of migratory fish. Noise, electromagnetic radiation, lightning, thermal and salinity emissions from the wind farm may cause disturbance to the migratory behaviour of salmon (*Salmo salar*). Potential negative impacts may cause changes in salmon migration routes and delays in migration, which may increase mortality or reduce reproductive success. Potential negative impacts may be cumulative if several wind farms are located on important salmon migration routes. Thus, the potential negative cumulative effects of different wind farms in the Bothnian Sea region on migratory fish should have been assessed.

The report only addresses harm to species based on the tolerance of certain species. It should also be considered at the ecosystem level, to assess whether, in the changed situation, there will be a competitive advantage for some species that will displace the existing species. A permanent change, even a small one, can have a long-term impact on the structure of the community.

The change in ice conditions or its impact on seals has not been assessed. Changes to seals may have transboundary effects.

Video surveys of the seabed carried out in November 2022 and June 2023 revealed only one species of brown algae (*Battersia arctica*) at a depth of 18.5 m and the impact assessment on the benthic vegetation has been based on this single species only. The lack of vegetation is explained by the depth of the study area (the illuminated zone extends to 23 m based on the visibility depth). However, November is late and June is the best time to observe benthic vegetation. The species composition is found to be consistent with previous data from the environmental surveys of the proposed wind farm, but the analysis for a single species appears to be limited.

The EIA report states (5.4.2 Sediment contaminants) that the sampling of the sediment surface layer (0-50 cm) from the six sampling stations indicates low levels of contaminants in the



sediment and there is no reason to expect that high levels will be found during the construction phase. However, high or very high concentrations of arsenic were found at two stations and organotin compounds at medium concentrations at four stations. At deeper depths, contaminant concentrations were assumed to be lower than the surface layer (0-50 cm).

Fisheries

The baseline status of the fish in the project area has been determined by exploratory net fishing and eDNA surveys. Observations have included salmon (*Salmo salar*), Common whitefish (*Coregonus lavaretus*), Vendace (*Coregonus albula*), sea trout (*Salmo trutta*) and river lamprey (*Lampetra fluviatilis*). ELY Centre regrets that gillnetting is poorly suited to open sea conditions. The methods used do not provide information on the biomass of the project area or on the abundance of fish species. A more appropriate study would have been an echo ranging as a background survey supported by fish sampling.

Regarding the eDNA studies carried out in June, it remains unclear whether the salmon DNA detected in the project area originates from female fish on their way to the rivers during the spawning migration or from migratory juveniles that left the river for the sea. It is therefore not possible to assess the importance of the project area for adult salmon and migratory juveniles. Regarding eDNA sampling, it is also unclear how the timing of sampling compares to the above-mentioned peak spawning periods for adult salmon or migratory juveniles. Presumably, salmon presence in the project area and detectable eDNA is most abundant at the time of peak migration. In any case, the results of the eDNA survey suggest that the project area is important for salmon.

The ELY Centre points out that the number of spawning salmon that have entered the Torne River has decreased sharply since 2022. In 2023, the number of rising salmon was down to around 20 000 salmon and in 2024 to around 24 000 salmon.

Weak salmon spawning migrations are estimated to lead to a reduction in the production of migratory juveniles and below the target level of the river-specific sustainable salmon stock (MSY). The current state of salmon populations in other rivers of the Bothnian Bay is also a cause for concern and all measures that negatively affect salmon survival need to be critically examined.

The surveys showed that whitefish were present in the project area at both times. For whitefish, the identification of the species of whitefish caught in the test net fisheries (lesser sparsely-rakered whitefish, lake-spawning whitefish, anadromous whitefish) would have clarified the assessment of the importance of the project area for the different species of whitefish. According to the survey, whitefish are present in the project area, but the importance of the area for the different species of whitefish and the different life stages of whitefish remains unclear.

The lamprey DNA was detected in the project area, especially in September. The DNA of the lamprey that was actually detected seems to be from the river lamprey (*Lampetra fluviatilis*), whose spawning season in the Baltic Sea is in autumn, starting around mid-August. Thus, the project area may be of importance at least as a spawning ground for the river lamprey.

The project area may be important as a feeding area for sea trout.

The flag-fishing culture of the Torne River valley is currently the subject of a joint Finnish-Swedish application 03/2025 for inscription on UNESCO's List of Intangible Cultural Heritage. If



the Polargrund Offshore wind farm (either alone or in combination with OWF Halla) has a negative impact on the migratory fisheries of the Torne River, this may have an impact on the World Heritage List.

Natura 2000 network sites

The effects of the project on sites in the Natura network on both the Swedish and Finnish sides are discussed in Annex D.19.

The closest Natura sites to the project area in the ELY Centre's area of competence are Merikalla (FI1100207, SAC, distance 24 km) and the islands of the Bothnian Bay (FI1300302, SAC and SPA, distance 43 km).

Merikalla is mentioned in Table 6 and its impacts are only briefly discussed in the text in the chapter on birds in Natura sites (3.4), although the conservation criteria for Merikalla do not include bird species. In addition, for example, the Bothnian Bay National Park at a similar distance (23 km) and the Bothnian Bay Islands further away from the project area are discussed in their own chapters (4.5 and 4.6). Merikalla is protected under the habitat type 1110 Underwater sandbanks, which are estimated to occur in the area of about 2800 ha (70% of the Natura area). Due to the large distance involved, the species typical of this habitat type are not expected to be affected and the risk to the Natura 2000 site is therefore assessed to be negligible. Similarly, the habitat types, Habitats Directive species and bird species that are the basis for protection on the islands of the Bothnian Bay are not expected to be affected due to the large distance. The ELY Centre of North Ostrobothnia agrees with this assessment. A shortcoming is that the impact assessment has not addressed any synergies with other pending offshore wind farm projects.

Noise

The EIA has included noise calculations for the noise during operation of the wind turbines and hydrogen production, and noise modelling and analysis for underwater noise during construction and operation.

Underwater noise is identified as the main source of noise during construction, especially during the piling of monopile foundations. This noise is also more widespread than, for example, the piling of lattice foundations. The noise impact has been assessed based on the macroscopic effects, i.e. monopile piling. The modelling has been carried out taking into account mitigation measures. Noise levels from piling are estimated to extend into Finnish waters. The duration of noise from the piling of a single foundation is expected to be short (one or a few days), but the total duration may extend over several construction seasons.

Wind turbines of 15 MW (Vestas V236-15 MW) have been used to calculate the airborne noise during operation. The total planned capacity of the project (3 000 MW) and the total number of wind turbines

(120), the wind turbines to be built in the project may have a power level higher than the power level used in the noise calculation. Further planning of the project should ensure that noise calculations and modelling are based on an upper limit of noise emission.

To limit the underwater noise generated during construction, certain noise protection measures have been taken into account in the noise modelling. These measures have been taken into



account in the conditions proposed in the applications for the piling. The proposed conditions for piling are justified.

Noise is not expected to have a significant impact on migratory salmon or mammals. The ELY Centre considers that there is uncertainty in the assessment and that there can be no certainty about the effects, especially in the future, taking into account the combined effects of the different projects. Underwater noise is known to repel fish and marine mammals and, as stated in the assessment, to cause hearing loss in fish. Underwater noise could potentially have population-level effects, especially if the noise from the operation is taken considered.

In terms of noise, no consideration has been given to the interaction with other wind power projects planned for the sea area. In a statement by the ELY Centre of North Ostrobothnia on 21.9.2022, the importance of examining the synergy effects of the Halla offshore wind farm project has been emphasised.

Invasive species

The EIA report states that global warming will affect the extent of ice cover in the future, but its impact on the warming of seawater has not been considered. This may interact with the heat and salt generated by hydrogen production, and thus with the change in species and the spread of invasive species. In particular, artificial reefs formed by foundations may pose a risk to the proliferation of invasive species. This could also have a negative impact on the Finnish side.

Birds and bats

According to the surveys carried out, there are few birds in the project area. No bats have been observed in the project area. The project area is located far from the sea and is not considered to be on an important migration route.

The ELY Centre of North Ostrobothnia considers that the amount of work spent on the bird surveys can be regarded as somewhat sufficient, although some uncertainty remains regarding the surveys carried out. No separate map of the feeding bird survey in the project area has been provided to show the locations where the surveys were carried out. No maps of the results of the surveys have been provided either. In addition, the map of the migration monitoring points in the bird survey report is somewhat imprecise and does not include explanations of all the symbols on the map.

The ELY Centre of North Ostrobothnia welcomes the table on the migration patterns of migratory birds presented in the bird survey report but considers it a shortcoming that such a table is only presented for autumn 2022. Furthermore, no more detailed information is provided on the direction of birds' migration routes in the evening, so that the direction of bird migration in relation to the project area remains unclear. Only a very general illustrative map of the direction of bird migration is provided.

Neither the EIA report nor its annexes indicate whether bird flight heights have been monitored during the bird surveys, nor are there any reasons given for not monitoring flight heights. Thus, the need to carry out collision modelling has not been examined. The ELY Centre of North Ostrobothnia considers the above to be a shortcoming.

Despite the above-mentioned shortcomings, the ELY Centre of North Ostrobothnia agrees with the assessment in the assessment report that the project is unlikely to cause significant harm to feeding and migratory birds in the area.



Maritime transport

The project developer will organise consultations and meetings on maritime safety and involve the Finnish Transport and Communications Agency Traficom. The ELY Centre considers this important, as the impact on maritime transport will, according to the assessment, also extend to maritime transport in Finland. The impact on maritime traffic is estimated to be limited to vessels currently passing through the project area and vessel traffic to and from the Finnish ports of Kemi and Tornio. In further work it is important to cooperate with the offshore wind farm project Halla and also with other offshore wind projects pending in Finland.

The Port of Oulu has been designated as a TEN-T port by the EU regulation that came into force in the summer of 2024. The ports of Tornio, Kemi, Raahen and Kokkola are part of the TEN-T network.

Landscape

For the purposes of landscape impact assessment, the marine area around the project area has been divided into zones. On the Finnish side, there are no islands in the so-called near zone (0-25 km), but in the so-called intermediate zone (25-50 km) on the Finnish side, there are continental shores (mainly along the Tornio-Simon coast), archipelagos and individual islands.

In the area covered by the North Ostrobothnia ELY Centre, the most significant sites in the intermediate zone from the point of view of landscape values and cultural environment are Hailuoto (distance 45 km) and Ulko-Krunni (distance approx. 44 km), which is part of the archipelago of Krunnit. The island of Hailuoto belongs to nationally valuable landscape areas and nationally significant built cultural environments. The western tip of Hailuoto, Marjaniemi, is a nationally renowned archipelago landscape with lighthouses, fishing huts and boats. Marjaniemi offers a 180-degree unobstructed view of the sea from a height higher than the surrounding coastal areas. The ELY Centre for North Ostrobothnia considers that the landscape impact assessment for the Polargrund project should have included a photo reference of Marjaniemi. In addition, the landscape impact assessment should in future consider the synergies with other offshore wind farms that are currently under construction and/or included in the proposal for the phased regional land use plan for energy and climate for North Ostrobothnia. If all these were to be realised, wind turbines would be visible along the entire horizon of Marjaniemi.

Impact assessment of the combined effects

In its previous opinions on the Polargrund project, the ELY Centre has pointed out that the assessment must consider that the Halla offshore wind farm (Halla Offshore Wind Oy) is planned in the immediate vicinity of the Polargrund project, about three kilometres to the south-east, where hydrogen production is also planned. The EIA procedure for the project has already been launched in August 2022 (www.ymparisto.fi/hallamerituulivoimaYVA) and the assessment report will be available for consultation in the near future. The international consultation on the Halla project under the Espoo Convention is being carried out by the Finnish Environment Institute (Syke). The projects are so close to each other that the combined effects will be clear. The ELY Centre considers it a shortcoming that neither the Halla project nor the other projects formally approved for planning in Finland have been taken into account or even shown on the map in the assessment. Justifications for omitting the evaluation of combined effects has not been presented. Nor does the file show whether the company planning the Halla project



cooperated with the Polargrund impact assessment. The projects are proceeding so simultaneously that a cumulative impact assessment would have been necessary. The Halla project has sought to assess the combined effects based on the available information, and the same should be required of the Polargrund Offshore project.

As pointed out earlier in this opinion, the Maanahkiainen wind farm planned and zoned for the coast off Raahe and Pyhäjoki would be necessary to take into consideration in the future, at least in the assessment of the combined effects on fisheries. The EIA procedure for the Pooki wind farm project is also underway (located about 20 km east of the Polargrund Offshore project area). The status of projects on the Finnish side should be monitored in the future and, if necessary, the combined effects of the projects should be considered.

Monitoring

The planned monitoring is so poorly presented that it cannot be commented on. It is stated that the monitoring programme will monitor any changes in the environment as a result of the activity, but it is not stated where the monitoring will be carried out or what will be monitored. In the aquatic ecosystem, monitoring should focus on fish, invasive species and seals.

The Finnish Border Guard

The Finnish Border Guard's statement on the Environmental Impact Assessment and permit application for the Polargrund Offshore Wind Farm and Hydrogen Plant in the Swedish Exclusive Economic Zone

The Finnish Border Guard has examined the Finnish Environment Institute's request for a statement on the Environmental Impact Assessment Report and the application for a permit for the Polargrund Offshore Wind Farm and Hydrogen Plant in the Swedish Exclusive Economic Zone.

In its statement, the Finnish Border Guard states the following:

- The risk assessment (including the impact on maritime traffic) has been dealt with in the assessment report and the application for a permit only from the perspective of Polargrund. The impact of offshore wind farms on maritime traffic should be considered as a whole, taking into account the combined effect of adjacent offshore wind farms. In this case, a joint assessment should be carried out with Halla on the Finnish side. If only the individual parks are considered, the risk assessment is incomplete and may give an inaccurate picture of the impact of offshore wind farms on maritime traffic (including ice formation and movements).
- Given the location of the Polargrund wind farm and the cooperation between Sweden and Finland in the field of marine rescue, the location of the wind turbines should take into account the possibility for marine rescue helicopters to operate inside the farm even in bad conditions. In other words, the spacing between individual wind turbines should be sufficiently large and they should be placed diagonally (in straight lines).
- In relation to the previous point, wind farm operators (including the construction phase) should be able to organise their own rescue arrangements for their staff on the wind farm site and be able to operate these arrangements from start to finish (injuries, incidents, etc.). For example, helicopters from the Border Guard will not rescue people directly from wind turbines.



- The location of the Polargrund Offshore wind farm near the fairways leading to the ports of the Bothnian Bay will affect maritime traffic in the area, especially in winter. Maritime traffic will be channelled through narrow passages between the wind farms. This will increase the risk of accidents for vessels, for example by reducing the distances between them and, in the event of problems, the risk of drifting inside the wind farms, especially in winter conditions. Adequate safety distances to the fairways and to other wind farms must be taken into account in the design. In principle, a wind farm should not compromise maritime safety, either during construction or during the operational phase.
- Considering the wind farm's location close to Finnish marine areas, the wind turbines should be required to have oil collection basins and plans in case of an environmental accident. This planning and preparedness should cover both the construction and operational phases.

Finnish-Swedish Border River Commission

Polargrund Offshore AB has applied for a permit under the Environmental Code to establish, operate and decommission an offshore wind farm in the northern Gulf of Bothnia, within Swedish territorial waters about 50 km off Kalix. The project plans to build up to 120 wind turbines with a maximum height of 350 meters. The wind farm is being developed by Skyborn Renewables through the project company Polargrund Offshore AB.

Impact on migratory fish

The Finnish-Swedish Boundary River Commission commented on the application and the environmental impact assessment from the perspective of migratory fish. The impacts on migratory fish are primarily those that may extend into the geographical area of the River Basin Agreement in Sweden and Finland.

The EIA report states that "existing information indicates that salmon use the project area and may migrate to the outer marine areas during its route to spawning grounds. Given the crucial importance of spawning migration and the fact that many important spawning rivers flow into the Bothnian Bay, the passage through this area is considered to be of high importance for salmon".

Skyborn has commissioned a study on how the proposed wind farm could disturb designated habitats and species and typical species in Natura 2000 sites. The study focused on impacts on birds, marine species and habitat. The company writes that "the wind farm project area is located far enough away from the Natura 2000 site that the operation will not cause disturbance that could affect the conservation status of the species concerned or the designated habitats with proposed conservation measures".

The Commission points out that the Torne River and Kalixjoki rivers are Natura 2000 sites and that salmon is a specially designated species to be protected in Sweden. Since salmon migrate such a long distance during their life cycle, the distance between the project activity and the Natura 2000 site is not so important if the activity has a negative impact, e.g. by hampering or delaying the salmon migration.

Cumulative effects

In the section on cumulative effects, the company notes that there are no existing or licensed wind farms, which means that no cumulative effects will occur. Thus, a basic assumption is made that no other wind farms are built offshore in the wider Baltic Sea area. The Commission



highlights that there is a need for assessment of combined and cumulative effects from the totality of planned offshore wind power in the area from the Gulf of Bothnia to the Southern Baltic Sea. This is important for migratory fish as it is known that the salmon of the northern rivers (e.g. Rivers Torne and Kalix) migrate all the way to the Southern Baltic Sea during their feeding migration. Although there are currently no existing or licensed wind farms on a large scale (except for the Tahkoluoto wind farm off Pori in Finland and some farms in the Southern Baltic), this does not mean that cumulative effects cannot occur. This especially if the currently planned amount of offshore wind power in the whole Baltic Sea area is expanded.

The Commission points out that there is a need for a more strategic and holistic impact assessment for the development of wind power in the wider Baltic Sea area. Single EIAs for one project at a time risks being too short-sighted and the overall picture of the current development of offshore wind farms in the Baltic Sea area may be missed.

In the EIA the project developer describes that: "The magnetic field will not generate significant behavioral changes in the species present in the project area. The environmental impact is therefore assessed as negligible. "

The Commission notes that although the change in behaviour caused by the magnetic field from a single offshore wind farm is negligible, the cumulative effect from several wind farms can lead to a significant change in behaviour. The Commission therefore stresses the need for a thorough assessment of cumulative impacts from a Baltic Sea perspective.

The Commission notes that there is no information on the exact migratory routes of migratory fish (except for information based on catch statistics). More information is needed on the migration of juveniles (smolt) from the river to the sea.

The Regional Council of Lapland

Environmental impact assessment report and permit application for the Polargrund Offshore offshore wind farm and hydrogen plant in the Swedish EEZ.

Project description

The Swedish Environmental Protection Agency is holding a consultation on the Environmental Impact Assessment Report and two applications for a permit for the Polargrund Offshore wind farm and hydroelectric power plant in the Swedish Exclusive Economic Zone (EEZ). The applications are for a licence under the Swedish EEZ Act and a licence under the Environmental Code.

The Polargrund Offshore offshore wind farm project is designed to produce either 10 TWh of electricity or 200 000 tonnes of hydrogen per year. The project site covers an area of 341 square kilometres and is located partly in the Swedish EEZ and partly in territorial waters in the municipality of Kalix. The project will consist of up to 120 wind turbines with a maximum height of 350 metres, with the project plan providing for alternative turbine spacing. The project area borders on the Finnish Exclusive Economic Zone and is located approximately 50 km from Tornio and Kemi. The project area is also 23 km from the Bothnian Bay National Park and 24 km from the Merikalla Natura 2000 site.

The wind farm is expected to generate and supply significant additional energy to northern Sweden in the form of electricity and/or hydrogen. The increase in electricity demand is estimated at an average of 5 TWh per year.

According to the technical description, it has not yet been decided where the offshore wind farm



can be connected to the electricity grid. Export cables are described in the EIA as an ancillary activity, which will be subject to a separate permit assessment at a later stage.

Hydrogen will be produced in a decentralised way by electrolysis in selected turbine bases of the planned offshore wind farm. It has not yet been decided how many wind turbines will be used for hydrogen production. Hydrogen production is planned to be decentralised, which means that the hydrogen electrolyzers will be installed at the turbine site. The electricity generated by these wind turbines will be used directly to power the equipment associated with the hydrogen production, i.e. these specific turbines will have no electricity supply or grid connection to the coast. Hydrogen is piped from the electrolyzers to one or more collection points and finally transported by pipeline to the coast.

Identified transboundary impacts

In the EIA report, environmental impacts on Finnish activities within the Swedish borders, such as maritime transport and commercial fishing, has been identified. Geographically, impacts in Finnish waters include the effects of underwater noise on fish, marine mammals and commercial fisheries, the effects of turbidity and sediment deposition on benthic habitats and the visual impact of offshore wind farms on the landscape. Risks to maritime traffic have also been identified. Of these, minor transboundary impacts are estimated for landscape and shipping, while no significant transboundary impacts are estimated for other factors. Risks to shipping have been identified as being greater in winter than in summer and the offshore wind farm has been identified as increasing the need for icebreaker assistance to ensure good maritime safety. According to the documents, the project has been adapted to mitigate the impact on icebreaker operations.

For the export cables considered as ancillary activities, impacts identified include sediment dispersion and deposition, physical impacts on the seabed and electromagnetic fields. However, these have not been identified as significant transboundary impacts.

Relationship to the regional plan and the marine spatial plan

In the region of Lapland, the Western Lapland Regional Plan, adopted on 19 February 2014, is in force in the Bothnian Bay area. The marine areas associated with the regional plan are designated as Water Area (W). In the regional plan, the marine area is designated with the following designations, among others.

- The archipelago of the Bothnian Bay has been designated as a Tourism Attraction Area as a destination area for tourism and recreation development (mv 8410).
- Recreational/tourist attractions (rm)
- Nature conservation areas/ sites (SL), including the Bothnian Bay National Park (SL 4041).
- Building preservation sites/ Structurally protected sites (SR)
- Areas / sites of importance for the preservation of the cultural environment or landscape (ma)
- Historical Monuments / Sites (SM)
- Fairways

In the region of Lapland, the wind power regional plan for the Kemi, Keminmaa, Simo and Tornio areas of the Lapland Sea and Coastal Region, approved on 16 June 2005, is in force in the Bothnian Bay area. The plan designates four wind energy areas: Röyttä in Tornio (tv 2281), Ajos in Kemi (tv 2282), Maakrunnin matalikko in Simo (tv 2283), which continues to Kuivaniemi, and Pitkämatala in Kemi and Simo (tv 2284), which continues to Ii.



The Regional Council of Lapland has identified potential areas for wind power production to support regional and local planning. The Lapland Solar and Wind Energy Study 2023-2024 identified three potential wind energy areas in the territorial waters of Lapland in the Bothnian Bay, totalling approximately 570 km².

The Finnish Maritime Spatial Plan 2030 has been in force since 15 December 2020. For the region of Lapland, the most important shipping routes run through the Gulf of Bothnia from south-north to the ports of Röyttä and Ajos. In the marine spatial planning, the Torne River, Kemi River and Simo River, have been identified as rivers with need for ecological connection. Tourism and recreational links have been identified between coastal towns and cities and to important recreational sites. Identified significant and potential areas for aquaculture, fisheries, cultural values, important underwater natural values, tourism and recreation are abundant in the Bothnian Bay area of Lapland. Regarding offshore energy production, the offshore wind energy area off Ii-Simo has been identified as a potential area for offshore wind energy production. Major changes in the operating environment have made it necessary to revise the Marine Spatial Plan. The aim is to revise the Marine Spatial Plan between 2024 and 2026.

The view of the Regional Council of Lapland

The report has identified several transboundary impacts relevant to Lapland, such as impacts on maritime transport, especially for winter shipping, and landscape impacts that may have an effect for example in the direction of the Bothnian Bay National Park. The Regional Council of Lapland points out that the consultation material indicates that the boundaries on transboundary impacts was rather limited and referred to several other sections of the report, and among other things, the photo montages mentioned in the texts were missing from the data, which made it difficult to form an overall picture of the impacts on the Finnish Lapland region.

The Regional Council of Lapland states that the decisions taken in the Swedish maritime areas will have an impact on the region of Lapland, its spatial structure, environment and development opportunities. This will have repercussions for the whole of Finland and possibly back to Sweden. The solutions in the Gulf of Bothnia, in Sweden and Finland, have a combined impact that could be significant for both countries. Such synergies may include impacts on maritime transport and thus on security of supply, on national defence, and on the environment, such as fish and bird migration. The Regional Council of Lapland would like to see the EIA procedure examine the joint and cumulative cross-border effects of offshore wind projects developed in the maritime area shared by Finland and Sweden.

In addition to the offshore wind farm, the assessment of the combined effects should consider power transmission solutions, where the environmental impacts are still poorly understood and where, for example, potential impacts on migratory fish may be transboundary. The impact on salmon in the Torne River was unclear in the EIA. The Regional Council of Lapland notes that the salmon in the Torne River is has significant cultural and economic importance in the Torne River Valley and the Bothnian Bay and the wider Baltic Sea. The landscape effects on the Bothnian Bay National Park can also be significant, for example, for the development of the tourism industry.

The Regional Council of Lapland expresses its concern about the impact of the planned offshore wind project on winter shipping in the Bothnian Sea in a changed geopolitical situation. The changing climate is also challenging winter navigation in the Bothnian Bay. In the EIA report, the transboundary impact has been assessed as negligible. The Regional Council of Lapland notes that winter navigation is of increased regional importance in Lapland and in the wider region of Finland. In addition, the Lapland Regional Council considers that it should be checked whether the connection between Kemi and Luleå, through the planned



offshore wind farm, is of importance for security of supply and military mobility. If necessary, the wind farm should be adapted to these needs.

Council of Oulu Region

Transboundary impacts

The EIA has identified indirect impacts on Finland in Swedish territory or waters, including on maritime transport and commercial fishing. Direct impacts on the Finnish territory would be the effects of underwater noise on various species of organisms and commercial fishing, and the effects of turbidity and sedimentation on benthic biota. The risks for maritime traffic would also increase on the Finnish side. The main transboundary impacts would be on the landscape and shipping, while other transboundary impacts are estimated to be minor.

North Ostrobothnia's regional plans and marine spatial planning

In North Ostrobothnia, there are the 1st, 2nd and 3rd phase regional plans in force, which are in the area affected by the Polargrund Offshore project, and the Hanhikivi nuclear regional plan outside the affected area. The North Ostrobothnia Energy and Climate Regional Plan is under preparation, with a public consultation on the proposal and consultation under the Espoo Agreement in September-October 2024. The regional plans only cover the land and waters of the province, i.e. the economic zone is not planned in the regional plan.

The area affected by the Polargrund Offshore project has been designated in the existing regional development plans with various plan symbols:

- Development principle symbol for the Bothnian Arc - Bottenviksbågen
- Hailuoto-Liminganlahti-Oulu tourism development principle symbol (mv-4)
- Fairways
- Nature conservation areas (SL)
- NATURA 2000 sites: Merikalla (FI1100207), Bothnian Bay Islands (FI1300302), Hailuoto, northern shore (FI1100201)
- Offshore wind energy areas (tv-2): Pitkämatala-Suurhiekka (202), Seljänsuu Shallow East (204), Seljänsuu Shallow West (207)
- National Landscape Area (Hailuoto)
- National Landscape Area (Krunnit)
- National Heritage Sites (RKY 2009) (Hailuoto, Ulkokrunni lighthouse and pilotage complex, li Röytän pilot station)
- Tourist services area (RM-1): Hailuoto Marjaniemi
- National Grassland Conservation Area (MY-hs): Marjaniemi-Hiidenniemi

All coastal regions have adopted Finland's first Marine Spatial Plan in December 2021. For North Ostrobothnia, the area affected by the planned Polargrunden Offshore Wind Farm Area has been identified as a maritime area, an energy production area, a fishing area, cultural values, tourism and recreation, and significant underwater natural values. A review round of the Marine Spatial Plan is currently underway and is expected to be adopted during 2026.

Opinion

The Council of Oulu Region Council thanks the Finnish Environment Institute and the Swedish Environmental Protection Agency for the opportunity to comment on the Environmental Impact Assessment Report and the application for a permit for the Polargrund Offshore Wind Farm and Hydrogen Plant. The studies are very comprehensive and the transboundary impacts have also been examined. Negative impacts have been identified for shipping, especially for



winter shipping. Taking into account not only the risk factors arising from the potential wind energy area but also the route changes for shipping, the costs and environmental impact of short sea journeys may not have been taken into account in their entirety. In the absence of experience with offshore wind power in icy regions, possible changes in ice formation and movement, and the interaction with climate change, could have a more significant impact than anticipated, for example, on merchant shipping. However, the year-round maritime connections in the north are vital for Finland's merchant shipping, security of supply and national defence.

The landscape impacts extend to North Ostrobothnia but are lower than in the Lapland region. The consultation material did not include photographs from the Finnish side. On the Finnish side, there are several offshore wind projects pending both in territorial waters and in the EEZ, but the material did not include any examples of possible synergies or possible wind shadowing effects. The environmental report ignores the potential impact of offshore energy production on migratory fish, which should therefore be investigated, and its relevance considered.

Regarding marine mammals, seals were highlighted in the environmental report and it was concluded that the project would not have a significant impact. However, about 80% of the Baltic ringed seal (*Pusa hispida botnica*) population is located in the Bothnian Sea. The breeding grounds and territories of the species are in the spring in the central Bothnian Sea on the packed ice floating on the outer sea. The concentration of Baltic ringed seals in the Bothnian Sea can be assumed to be due to the ice conditions in the area. Global warming and diminishing ice coverage are a real threat to the Baltic ringed seal. The maintenance of wind farms is also carried out in winter, which increases the pressure on the Baltic ringed seal. The developer has not yet decided whether the energy produced by wind power will be transferred to the coast as electricity and/or hydrogen. Hydrogen production would be decentralised within the project area. The project has focused comprehensively on the technical solutions, but no calculations had been presented on the role that onshore hydrogen production would play, where the abundant waste heat and oxygen production generated in the process could be put to beneficial use.

The Council of Oulu Region considers that the studies have been quite comprehensive and considers the project to be feasible if the precautionary principle is applied to minimise the risks to the environment, the safety and security of merchant shipping and Finland's security of supply, also in winter conditions. More comprehensive information on the effects on the behaviour of migratory fish should be obtained. Interactions with other wind power projects in the northern part of the Bothnian Sea and adaptation to climate change should also be taken into account in the implementation of the project.

The Finnish Transport and Communications Agency Traficom

Environmental impact assessment report and permit application for the Polargrund Offshore offshore wind farm and hydrogen plant

The Finnish Environment Institute has requested a statement opinion of the Finnish Transport and Communications Agency Traficom on the Environmental Impact Assessment Report and the application for a permit for the Polargrund offshore wind farm and hydrogen plant in the Swedish EEZ and territorial waters.



In its statement, Traficom makes the following points:

The eastern edge of the planned Polargrund offshore wind farm borders the outer boundary of the Finnish and Swedish Exclusive Economic Zones and the maritime traffic area designated in the Finnish Maritime Spatial Plan. The Polargrund offshore wind farm is located in front of four shipping lanes, which are used by maritime traffic from the ports of Tornio, Kemi and Oulu, among others. Other offshore wind farms are also planned in the vicinity of the Polargrund offshore wind farm, both in the Finnish and Swedish maritime areas. In addition, energy production areas (offshore wind farms) have been designated in the Finnish and Swedish offshore plans.

From Finland's perspective, the planned Polargrund offshore wind farm and its immediate foreground is an important maritime traffic area, as practically all the traffic of the northern Bothnian Bay ports pass through the area.

The Polargrund offshore wind farm also serves as a key route for Finnish and Swedish icebreakers, and the traffic through it plays an important role in ensuring the smooth operation of winter shipping in the whole of the Bothnian Bay.

Traficom reiterates the view expressed in its earlier statement of 20 September 2024 (dnro TRAFICOM/506214/04.04.05.01/2024) on the changes to the Polargrund offshore wind farm; in order to manage the overall impact of the projects, the location of offshore wind projects in the Finnish and Swedish EEZs in relation to the outer boundary of the EEZ and other offshore wind areas should be agreed centrally between the countries in the Gulf of Bothnia. This would allow for sustainable planning and coordination of different land uses across the entire maritime area and for uniform and balanced guidance between different offshore wind projects. Allowing individual developers and projects to plan zoning around the outer boundary of the EEZ before harmonisation of policies and guidelines between states will not allow for a managed overall land use or equitable project governance.

A common approach would be important for the entire Gulf of Bothnia maritime sector, as the outer borders of the countries' Exclusive Economic Zones (EEZs) are important maritime transport areas for both countries, where large offshore wind farms are planned.

The risk assessment for the Polargrund offshore wind farm proposes a safety distance of 1.19 nautical miles between the offshore wind farm and the fairway (maritime traffic area) to meet the criterion of an acceptable safety distance for avoidance measures as recommended (the calculation of the safety distance does not take into account ice conditions). As the proposed offshore wind farm bounds the outer boundary of the Finnish and Swedish EEZs, the risk assessment of the project has proposed to extend the safety distance to the Finnish EEZ, which would reduce the maritime traffic area identified in the Finnish Maritime Spatial Plan by 1.19 nautical miles. Traficom states that the eastward shift of the maritime traffic area cannot be achieved without modifications to the fairways of the merchant shipping lanes on the Finnish side and the resulting extensive dredging in challenging offshore conditions, as the water depths in the area are shallower than the rake depths of the adjacent fairways in some places. The outer ends of the fairways (approach areas) must be open and safely navigable. Furthermore, the Finnish maritime authorities have not been contacted about the plans for the fairways. Traficom considers that the safety distance required by the Polargrund offshore wind farm from the maritime traffic area should be dimensioned for the Swedish EEZ, so that the safety distance does not reduce the most important - and for the largest vessels the only - traffic



area for the ports of the Bothnian Bay. Traficom points out that there are also offshore wind plans by project developers to the east of the traffic area, in the Finnish EEZ. In addition, the area is designated as an energy production area in the Finnish Maritime Spatial Plan, making it a potential offshore wind farm area, and the pressure for offshore wind planning is therefore also exerted in the Finnish EEZ in the vicinity of the traffic area, underlining the importance of coherent practices and coordination in the area.

The risk assessment of the Polargrund offshore wind farm has proposed a new one nautical mile wide shipping lane in the Finnish EEZ, which would ensure a safety distance of 1.19 nautical miles from the Polargrund offshore wind farm. Traficom points out that the area is located in a maritime traffic area of approximately 3.5 nautical miles in width, as indicated in the Finnish Maritime Spatial Plan.

During the winter months, maritime traffic uses the full width of the traffic zone (sometimes even wider) to ensure smooth navigation in challenging winter conditions. Traficom considers it important that the width of the maritime traffic zone along the border between the Finnish and Swedish Exclusive Economic Zones is not reduced by the planned offshore wind farms in the area. Due to this, Traficom and the Finnish Transport Infrastructure Agency have previously instructed offshore wind farm projects located in the vicinity of the Polargrund offshore wind farm in the Finnish EEZ to set a distance of three nautical miles between the offshore wind zone and the outer edge of the EEZ (if a similar practice were also applied on the Swedish side of the EEZ). Traficom proposes an equivalent distance of three nautical miles between the Polargrund offshore wind farm and the outer edge of the Swedish EEZ. A continuous offshore area free of offshore wind farms on both sides of the border would ensure safe and smooth maritime traffic all year round and would also effectively prevent possible interference with ships' radar and radio equipment/systems and satellite positioning systems.

It would have been desirable to include in the impact assessments of the Polargrund project also offshore wind farm projects in its vicinity and their cumulative effects on shipping. For example, the traffic modelling of the area does not consider the planned adjacent offshore wind projects, which, if implemented, would also have a significant impact on traffic off the Polargrund offshore wind farm.

In the further planning of the project, it would be important to identify and assess the impacts of offshore wind farms on maritime radar, radio and satellite positioning systems and to carry out field tests during the construction phase of the wind farm to assess the impacts, so that possible mitigation measures for maritime radar, radio and satellite positioning systems can be implemented as soon as possible. Impacts should be assessed not only on radio and radar systems and satellite positioning systems of vessels operating in the areas of operation, but also in exceptional situations where vessels have drifted close to an offshore wind farm or offshore wind farm.

Natural Resources Institute Finland

Introduction

A Polargrund Offshore wind farm, consisting of up to 120 wind turbines, is planned for the Swedish EEZ in the Bothnian Bay. The Finnish Environment Institute received from the Swedish Environmental Protection Agency the environmental impact assessment documents for the project, which include an assessment report with annexes and two permit applications. The



Finnish Environment Institute has requested the opinion of the Finnish Natural Resources Institute (Luke) on the project's EIA. The statement should focus on the views on the likely significant transboundary environmental impacts of the project for Finland. In its statement, Luke will only comment on matters related to its own field of competence.

Migratory fish

The importance of the Bothnian Bay and the rivers flowing into it for migratory fish is generally well emphasised in the assessment report with regard to salmon, but the anadromous whitefish (*Coregonus lavaretus*) receives very little attention, and the migratory River lamprey (*Lampetra fluviatilis*) is not mentioned at all. The fact that migratory fish and lampreys from rivers on the Finnish side of the Bothnian Sea also migrate through or feed in the Polargrund project area is not considered at all. As transboundary impacts, only the potential effects of the direct consequences of the planned activities in the project area (noise, turbidity, and sediment deposition) on Finnish waters and the fish there are mentioned. In this context, Luke emphasises that the potential impacts of human activities on migratory fish in the Bothnian and Baltic Sea will inevitably affect fish stocks in both countries, regardless of which country's waters are affected.

Luke estimates that underwater noise from piling operations is one of the main potential impacts on migratory fish. The key period when migratory fish are potentially most abundant in the project area is from late May to mid-July. This is when the fry of salmon (*Salmo salar*), trout (*Salmo trutta*), whitefish (*Coregonus lavaretus*) and lamprey (*Lampetra fluviatilis*) have just migrated from the river to the sea and the spawning migration of adult salmon is at its peak. Project implementation should be timed to allow for piling as little as possible for the period in question or avoid them altogether until more research is available. If piling cannot be avoided completely at this time, it should be paused, e.g. alternately. This would allow fish migration through the affected area to take place undisturbed during the breaks. At the same time, the turbidity of the water caused by the piling would be temporarily reduced.

The effects of the Polargrund Offshore wind farm during operation are difficult to predict. It is possible that underwater magnetic fields or underwater noise from turbine rotation may affect the movements of migratory fish in the area, but the risk of significant impacts is likely to be low. However, there is no information on the potential effects of magnetic fields, especially in conditions of the Bothnian Bay. Possible reef effects could theoretically have both negative and positive impacts, but there is currently no research data on these impacts applicable to the Bothnian Sea either and the impacts are likely to be minimal at most.

A critical stage in the life cycle of migratory fish is the transition from the river's breeding grounds to the sea's feeding grounds. At this time, the fry is at a physiologically sensitive stage of adaptation to salt water and orientation to migration. The fry must be able to avoid predation by predators, to which it is particularly vulnerable during its migration, and to move on to new food sources. Various anthropogenic changes to the migration route environment, especially during construction and piling works, can cause changes in migration behaviour, delays in migration or alterations to the migration route, which typically increase mortality either immediately or later in the migration. In Luke's view, this early phase of the migration could have been given a little more attention in the assessment report. There is currently little research data available on this topic, but there is scope for further research, particularly using acoustic telemetry. A joint project between Luke and SLU (Swedish Agricultural University) has been



launched to study the behaviour of migratory fish, mainly sea trout (*Salmo trutta*), in the Torne River using acoustic telemetry in the archipelago on the bottom of the Bothnian Sea. The first results show that trout fry migrate rapidly (1-3 days) through the archipelago in a south-southwest-south-east intersector, i.e. the open sea of the Gulf of Bothnia. The Polargrund Offshore project area lies within this sector. It would also be appropriate to obtain similar data from the Bothnian Bay, for example in cooperation with offshore wind farm projects in the region. More generally, potential impacts on migratory fish (juvenile migration, feeding and fish migrating for spawning) during operation would most likely be the result of the combined effects of several projects, which would require more research data, especially on salmon and anadromous whitefish (*Coregonus lavaretus*), adapted to the conditions in the Bothnian Sea, to predict and monitor.

Fishing

As stated in the assessment report, the project area has been of limited importance for commercial fisheries and therefore the implementation of this single project would not have a direct impact on commercial fisheries.

Birds

The location of the project site on the open sea in the middle of the Gulf of Bothnia reduces the risk of adverse impacts on birds, such as the risk of collisions. There are no suitable nesting skerries or islands near the project area, nor are there any feeding areas where birds would gather in large numbers. The migration routes of large birds are generally closer to the coast. However, migration routes on the high seas are generally poorly known. This could be mainly the case for loons (*Gavia* spp.), Common Scoter (*Melanitta nigra*) and Velvet Scoter (*Melanitta fusca*). In bad weather conditions, crane (*Grus* spp.) migration may also occur in the area. In the Bothnian Sea

GPS monitoring of the Greylag Goose (*Anser anser*) has also detected autumn movements of geese across the Bothnian Sea from Finland to Sweden.

Several wind farms are planned for the Bothnian Sea, such as Pooki, Halla, Röyttä, Omega and Oulunsalo-Hailuoto, which are located near the Polargrund Offshore Project area. The combined effects may therefore also affect the bird population in the Finnish region. However, it is very difficult to predict such interactions based on the available data. Efforts should be made to anticipate and assess potential impacts through extensive transnational cooperation, where necessary covering the entire range of species. The main species-specific migration routes must be considered in the environmental impact assessment of projects. At the same time, the most obvious data gaps should be identified, and a determined effort should be made to collect the additional bird data needed to anticipate interactions.

Seals

Seals are most sensitive to direct human disturbance, especially during the breeding (spring-winter) and moulting (spring) seasons. Seals are territorial to their breeding and moulting grounds, but they can forage over a wide area. Seal populations should therefore also be considered as transboundary populations in the Bothnian Bay, where measures taken in one country have a wider impact. Similarly, the combined effects of different projects should be considered in addition to individual projects.



In the Baltic Sea, the Grey Seal (*Halichoerus grypus*) and the Baltic Ringed Seal (*Pusa hispida botnica*) are found. The Bothnian Sea is a feeding and moulting area for the Grey Seal. However, the area is particularly important for the Baltic Ringed Seal, as good ice conditions make it the best seal habitat in the Baltic Sea. Indeed, around 80% of the Baltic Ringed Seal population lives in the Bothnian Sea. An eDNA survey would not have been needed to identify a larger proportion of the Baltic Ringed Seal.

The Polargrund Offshore project area is likely to be in key breeding and moulting areas of the Baltic Ringed Seal. However, the section on seals in the environmental impact assessment is incomplete. For example, the assessment report states (especially regarding airborne noise) that since "resting sites naturally vary from year to year, the project area is not considered to be of particular importance for the moulting season of the Baltic Ringed Seals". It is difficult to find any justification for this view.

For Grey Seals, the assessment notes that the project area is far from known resting sites. The assessment does not consider the Grey Seal moulting skerries found on the Finnish side. The Grey Seal also moults on ice, if present, in the area during the moulting season.

The assessment report states that underwater noise during the construction phase will have only a minor impact on both species, as the aim is to build during open water and not during the most sensitive periods for seals. Also, during the operation phase, during the ice period, "the impact of underwater noise is practically negligible, as most seals spend most of their time on the ice". This line of reasoning is difficult to follow and is based on a lack of knowledge of seal biology.

However, for both airborne and underwater noise, the assessment report states that noise can cause behavioural changes such as avoidance of the area both during the meltwater and during the breeding season. However, this is thought to occur only at the individual level and is not expected to have a significant effect at the population level. It remains unclear on what the estimate of no population-level effects is based.

The assessment report also states that seals are present in the area during the ice-free season, but "there is no evidence to suggest that the area is particularly important as a feeding area for seals or that large numbers of individuals spend much time there." However, seal surveys in the Bothnian Sea show that seals move over a wide area in search of food and there is nothing to suggest that the project area is not also a feeding area for seals.

The impact assessment carried out is of poor quality. In general, the impact assessment on seals focuses mainly on the wind turbines themselves (and even then, only in a superficial way) and does not consider other activities. However, the project would increase human activity in the area for decades due to the operation, maintenance, and servicing of the wind turbines. These changes would affect offshore areas, which have typically been reasonably quiet. The assessment does not take this into account at all, stating in a cursory manner that 'underwater noise from maintenance vessels will not be significantly affected' and that 'there is already regular maritime traffic in the area, however, so increased shipping activity during the construction phase will not add a new source of noise to the overall soundscape of the area'.

Luke also points out that the use of eDNA for impact assessment is not a realistic research method for seals. The method can provide a snapshot of species abundance, but it does not



provide an indication of abundance and, for example, the importance of a particular area for foraging.

Luke points out that a single wind farm project will not typically have a significant impact on seals if the area is not a key breeding and/or moulting area, but it is important to consider the combined effects of wind power (and other similar construction projects), increased shipping and a changing climate when planning activities. However, the assessment has not addressed the combined effects on seals at all. These could apply to the entire seal population in the Bothnian Sea.

Summary

Several offshore wind projects are planned for the Baltic Sea. In principle, the Polargrund project could also have environmental impacts on the Finnish side. Any clearly discernible adverse environmental impacts on migratory fish, birds or seals would, if they were to occur, be likely to be the combined result of several projects. The Polargrund project area is not relevant for trawling by Finnish vessels.

In particular, the environmental impact assessment for seals in the Polargrund Offshore project area is of poor quality. The assessments for migratory fish and birds are also deficient. Unfortunately, the assessment of the potential combined effects of several projects remains weak because of the lack of basic information. More research data is needed.

The Finnish Fishermen's Federation (FYFF)

Statement on the assessment report and application for authorisation of the planned Polargrund offshore wind and hydrogen power plant industrial area in Sweden.

The Finnish Fishermen's Federation (FYFF) issues the following statement on the matter.

Many offshore wind industrial sites are currently being planned in the Bothnian Sea, the Gulf of Bothnia and the northern parts of the Baltic Proper.

FYFF believes that too much knowledge is still lacking regarding the impact of offshore wind areas on the marine environment, in particular on different fish species. More knowledge needs to be developed and analysed before permits can be granted for offshore wind energy.

Further offshore wind industrial areas are planned in the Gulf of Bothnia. In Sweden Bothnia Offshore Omega and on the Finnish side Laine/Reimari and Suurhiekka/Pooki. The Finnish fishing industry is concerned about the large number of wind energy developments planned in our surrounding waters and the cumulative impact these may have on the environment, fish stocks and the fishing industry.

Migratory fish are sensitive to changes in the aquatic environment and special attention should be paid to this when planning projects in the Gulf of Bothnia. The Natural Resources Institute of Finland (Luke/Lappalainen) has in its statement of 18 November 2024 paid particular attention to migratory fish and we refer to the comments made in the statement.

Hydrogen production in the area in question represents a new environmental impact factor in the area (hot water and saltwater discharge).

We call for a comprehensive analysis of the cumulative impact of the planned industrial sites on the ecosystem and of future fishing opportunities in the area before individual decisions are made on measures and activities competing for space.



In addition to the impact of the production area itself, the impact of the cables and pipelines in the production area and the transmission to shore should also be carefully analysed.

The key point, if a permit is granted after all, is that a monitoring programme should require the applicant (as a condition) to monitor the impact of the industrial area and activities (including cables and pipelines) on fish stocks in general and on the migration patterns of salmon and whitefish in particular, as well as on the fishing industry.

The applicant shall also be required to compensate for any damage caused by the activity to the environment and the fishing industry.

Finnish Transport Infrastructure Agency (Väylävirasto)

The planned area of the Polargrund offshore wind farm is bordered to the east by the outer boundary of the Finnish Exclusive Economic Zone and the navigation area of the Finnish Maritime Spatial Plan, through which most of the shipping traffic in Tornio and Kemi passes. The eastern boundary of the area is also close to the ends of the Tornio and Kemi fairways and the 10 m Oulu fairway. In addition, other offshore wind projects are planned in the vicinity of the planned Polargrund Offshore project site, both in the Swedish and Finnish Exclusive Economic Zones.

The area around Polargrund Offshore is an important area for Finnish shipping. In addition, sea ice occurs in the area every year and the ice conditions in the area are among the most demanding in the Bothnian Sea. The area is covered by ice for several months of the year and the ice is relatively thick, mobile and deformed, which poses major challenges for navigation. The Polargrund area is also crossed by icebreaker traffic as breakers move between relief operations.

With the Polargrund Offshore area bordering the outer boundary of Finland's exclusive economic zone at a point that is of great importance for shipping, the coordination of offshore wind energy areas between countries, as already mentioned by the Finnish Transport Infrastructure Agency, becomes even more important. The year-round organisation of maritime traffic in the Gulf of Bothnia and Bothnian Bay requires the coordination of offshore wind energy areas between Sweden and Finland in order to ensure that all ports remain open to traffic even in icy conditions.

The 1.19-mile safety distance between the offshore wind farm and the marine traffic area in the Polargrund risk assessment does not take into account the ice conditions in the area and the changes they may cause to marine traffic in the area. During ice-free periods, maritime traffic does not follow the same routes as during open water but is routed according to the easiest ice conditions and, in the northern parts of Gulf of Bothnia in the height of winter, also according to where commercial vessels can operate at all.

As a result, maritime traffic needs more space during ice-free periods than during open water.

The extension of the safety distance to the Finnish EEZ, as proposed in the Polargrund Offshore risk assessment, is scandalous, as it would reduce the space available for shipping in an area that is critical for traffic in and out to Tornio, Kemi and Oulu. The shallowness of the sea area makes it impossible to move traffic eastwards. In addition, moving traffic eastwards would affect the navigability of the Tornio, Kemi and Oulu fairways by making it more difficult to approach the outer edges of the fairways as the available space is reduced. The safe use of the



fairways also requires sufficient space for their approach areas on the open sea. The protection area must be dimensioned on the Swedish side of the EEZ.

Finnish Transport Infrastructure Agency and Traficom have instructed offshore wind projects planned for the Finnish EEZ near Polargrund Offshore project area to leave a distance of three nautical miles between the wind farm and the outer boundary of the EEZ. The Swedish Fairway Agency proposes a corresponding distance of three nautical miles between the Polargrund offshore wind farm and the outer limit of the Swedish EEZ to ensure safe and smooth year-round navigation.

It would have been desirable to include in the impact assessments also offshore wind farm projects in the vicinity of the Polargrund offshore wind farm and their cumulative impacts on shipping. For example, the traffic modelling of the site does not take into account the planned adjacent offshore wind projects, which, if implemented, would also have a significant impact on traffic off the Polargrund offshore wind farm.

In the further planning of the project, it would be important to identify and assess the impacts of offshore wind farms on maritime radar, radio and satellite positioning systems and to carry out field tests during the construction phase of the wind farm, so that impacts and possible mitigation measures on maritime radar, radio and satellite positioning systems can be implemented in the shortest possible timeframe. Impacts should be assessed not only on radio and radar systems and satellite positioning systems for vessels operating in the areas of operation, but also in exceptional situations where vessels have drifted close to an offshore wind energy area or offshore wind energy area.

Geological Survey of Finland (GTK)

The Finnish Environment Institute, as the competent authority for the Espoo Convention in Finland, is seeking comments on the Environmental Impact Assessment Report and the application for a permit for the Polargrund Offshore Offshore Windfarm and Hydrogen Plant in the Swedish EEZ. The Geological Survey of Finland (GTK) thanks you for the opportunity to comment on this matter.

The Polargrund Offshore wind farm project area is located in the Gulf of Bothnia, in the Swedish territorial sea and EEZ, bordering the Finnish EEZ. The project area is located about 50 kilometres from Tornio and Kemi, and about 70 kilometres from Oulu. The project area is also 23 km from the Bothnian Bay National Park and 24 km from the Merikalla Natura 2000 area.

GTK has reviewed the contents of the Espoo consultation documents and their annexes, focusing on the EIA and the potential transboundary environmental impacts identified in the EIA.

The project is expected to have some transboundary impacts, of which turbidity and sediment deposition related to bottom reworking, especially during the construction phase, fall under the remit of GTK.

The consultation documents provide a comprehensive overview of the studies and research carried out in this area. The chosen methods of cable laying reduce the sedimentation effect and the sediment contaminant studies show that concentrations are mostly low. In addition, the modelling addresses the potential impacts of sediment transport, which have a limited impact on the Finnish side. Overall, however, the impact on benthic fauna and flora is estimated to be negligible.



GTK also considers it important that the report has highlighted the importance of cumulative impacts and the uncertainties associated with them, such as planned offshore wind farms in addition to those already existing and authorised. Especially in the current situation, where there is also a large increase in the amount of planned offshore wind power in the Gulf of Bothnia, which increases the risk of cumulative impacts, also regarding transboundary impacts. Based on the Environmental Impact Assessment Report for the Polargrund Offshore Offshore Windfarm and Hydrogen Plant, GTK considers that the project will not have significant adverse impacts on the abiotic marine environment beyond the borders of Finland. GTK has no further comments on the report.

Finnish Meteorological Institute

Finnish Meteorological Institute's statement on the Environmental Impact Assessment Report and permit application for the Polargrund Offshore offshore wind farm and hydrogen plant in the Swedish EEZ

Developer Skyborn Renewables is exploring the possibility of setting up offshore wind and hydroelectric power generation in the Swedish Exclusive Economic Zone (SEZ) and the territorial waters of the Bothnian Sea. The project area borders the Finnish EEZ and is located about 50 km from Tornio and Kemi and about 70 km from Oulu. The project area is also 23 km from the Bothnian Bay National Park and 24 km from the Merikalla's Natura 2000 area. The size of the project area will be reduced by about 20% compared to the original plan.

The wind farm would consist of up to 120 wind turbines with a maximum total height of 350 m. The total area of the project site is about 341 km², with an average depth of about 45 metres.

The Finnish Environment Institute has asked the Finnish Meteorological Institute for a statement on the Environmental Impact Assessment Report and the application for a permit for the Polargrund Offshore Windfarm and Hydrogen Plant in the Swedish EEZ.

The Finnish Meteorological Institute has studied the proposal and has the following comments:

Regarding the marine research, the Finnish Meteorological Institute considers the EIA report to be comprehensive. It is excellent that the effects on 'environmental monitoring stations' have been included in the EIA report. However, the environmental monitoring stations have been considered mainly based on measurements made by Sweden and e.g. the Swedish National Monitoring Station (NTM).

The free drifting Argo buoys (<https://fleetmonitoring.euro-argo.eu/dashboard?Status=Active,Inactive&Basin=BALTIC%20SEA>) raised by the Finnish Meteorological Institute in a previous statement have been ignored. The Finnish Meteorological Institute considers that the project developer, together with other actors (e.g. SMHI/Meteorological Institute), should further investigate the possibility of compensating for any missing measurements during the construction of the park by building a dedicated measuring station in the park area. In addition, the Finnish Meteorological Institute considers that, although the modelling suggests that the effects of the effluent released during hydrogen production will be minimal, the project design should build the system in such a way that, for example, the flow rate/nozzles can be adjusted to maximise mixing (turbulence). If the mixing is too low, when the water reaches the bottom, it will be considerably saltier than its surroundings (>10 per mil vs. <5 per mil) and can easily form its own layer, which will not be able to mix any more.



As in the previous opinion (630/03.00.02/2024), the Finnish Meteorological Institute has no comments to make on the weather radars, as the area is more than 20 km from the nearest weather radar.

City of Kalajoki

The project area will be located far out to sea, close to the Swedish coast and archipelago. The distances from the Polargrund offshore wind farm to the coast of Kalajoki and Maakalla are 91-105 km, so the Polargrund offshore wind farm is not expected to have any significant landscape, visual or other impacts on City of Kalajoki.

At this stage, the City of Kalajoki has no further comments on the Environmental Impact Assessment Report and permit application for the Polargrund Offshore wind farm and hydrogen plant in the Swedish EEZ.

The Government of Åland

For the Government of Åland, there is no need to comment on the assessment report and the licence application for the Polargrund Offshore wind farm and hydrogen power plant in the northern Gulf of Bothnia, Sweden.

Justification: The distance is so far from Åland that direct impacts on Åland coastal waters are considered unlikely.

The ELY Centre of Southwest Finland

The proposed project is located in the Bothnian Bay, more than 350 kilometres from the areas of the ELY Centre of Southwest Finland. The ELY Centre of Southwest Finland considers that the project will not have a significant impact on Southwest Finland and the Satakunta region. The ELY Centre of Southwest Finland has no comments.

The Finnish Safety and Chemicals Agency (Tukes)

Tukes has taken note of the request for comments. Tukes has no comments to make as according to the EIA report, the project has no significant impacts on the Finnish territory from the point of view of chemical safety legislation.

Conclusions

Based on the information presented in the Polargrund Offshore's supplementary consultation letter dated on 28 August 2024, all submitted comments and proposals for the scope of the project received in the earlier phase of the transboundary consultation process will be considered in the application and EIA, as well as comments and proposals submitted in response to this supplementary notification. However, already during the supplementary consultation period on 3 October 2024, the Finnish Environment Institute received an invitation to submit comments in accordance with Articles 4 and 5 of the Espoo Convention on Environmental Impact Assessment in a Transboundary Context regarding the planned offshore wind farm and hydrogen plant Polargrund Offshore in Sweden's territorial waters and exclusive economic zone from Naturvårdsverket. This means that the response submitted by Finnish Environment Institute on 8 October 2024 has not been considered in the environmental impact assessment or in the permit process.



The Finnish Environmental Institute requests that all the statements from the Finnish Authorities and public submitted on 30 August 2022, 8 October 2024, and those that are attached to this letter need to be taken fully into consideration. Therefore, the Finnish Environment Institute requires that the impact assessment need be supplemented in accordance with the all the responses received in Finland in the context of the Espoo Convention and the environmental impact assessment of the project Polargrund Offshore. The Finnish Environment Institute notes that the permit granting procedure cannot be completed until all the response from Finland has been considered and responded to and the negotiations under the Espoo Agreement have been concluded.

Head of Services

Jenni Juslén

Senior Officer,
Point of Contact to the Espoo Convention

Ulla Helminen

This document has been electronically signed.



Appendices	Statements received in Finland in Finnish and Swedish
Distribution	Swedish Environmental Protection Agency
For information	Ministry of the Foreign Affairs Ministry of the Environment Finnish Border Guard Centre for Economic Development, Transport and the Environment of Lapland Centre for Economic Development, Transport and the Environment of North Ostrobothnia Centre for Economic Development, Transport and the Environment of Southwest of Finland The Regional Council of Lapland Council of Oulu Region Finnish – Swedish Transboundary River Commission Natural Resources Institute Finland (Luke) Finnish Meteorological Institute Finnish Transport Infrastructure Agency Finnish Association of Professional Fishermen (SAKL) Finnish Transport and Communications Agency Traficom Geological Survey of Finland City of Kalajoki The Finnish Safety and Chemicals Agency The Government of Åland

