

Authority Services

17.9.2025

SYKE/2025/1479

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Reference: NV-25-033464

Finland's response to the letter regarding the environmental impact assessment of the offshore wind farm Mimer in Sweden's Exclusive Economic Zone

The Finnish Environment Institute acknowledges that Finland has received the notification, dated 16 July 2025, and the consultation documents from Sweden in accordance with Article 3 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), regarding the planned offshore wind farm "Mimer" in Sweden's Exclusive Economic Zone.

The developer EnBW Sverige AB intends to construct an offshore windfarm named Mimer, east of Hudiksvall, in Gävleborg County. The planned windfarm will consist of 68-114 wind turbines with a total capacity of circa 1700 megawatts (MW), as well as one or more masts or buoys for wind measurement. The project area covers approximately 245 square kilometres. The planned maximum power of one wind turbine is 15-25 megawatts (MW), and the maximum height above sea level is up to 370 metres.

Consultation in Finland

In accordance with Section 30 (911/2022), Subsection 1 of the Finnish Act on Environmental Impact Assessment (252/2017), the Finnish Environment Institute is the competent authority and responsible for tasks under the Espoo Convention.

The Swedish Environmental Protection Agency requested an indication whether Finland intends to participate in the EIA procedure of the planned Mimer Offshore Wind Farm project, provide comments concerning the scope for the assessment of the environmental impacts of the project affecting Finland and submit comments from the public and the authorities in Finland.

The public and the authorities were given the opportunity to comment on the consultation documents from 18 July to 9 September 2025, which were available on the website of Finland's environmental administration and on a platform by Ministry of Justice in Finland for requesting and submitting statements electronically (lausuntopalvelu.fi). Statements were also requested from relevant stakeholders.



Remarks received during the consultation

The Finnish Environment Institute has prepared an English summary of the 16 statements received in Finland. The original statements in Finnish or Swedish, which are enclosed to this letter, include important and detailed remarks which need to be examined and taken into consideration in their entirety in the EIA.

Centre for Economic Development, Transport and Environment for Lapland

Environmental impacts on Finland

According to the EIA programme, the project may have the following impacts, among others: on geology and seabed conditions, fish, marine mammals, birds, bats, commercial fishing, the landscape, and combined impacts with other offshore wind farms.

The Centre for Economic Development, Transport and the Environment for Lapland states that the consultation document does not highlight any possible transboundary impacts on Finland, nor does it include a map showing the exact distance of the project area from the border of Finland's exclusive economic zone. Based on the general map of the project area (Figure 1), the distance from the border of Finland's economic zone is estimated to be approximately 20 kilometres. The Centre for Economic Development, Transport and the Environment of Lapland considers that the environmental impact assessment report should indicate the distance and location in relation to Finland and assess the environmental impacts on Finland.

Impacts on aquatic organisms and marine management objectives

From the perspective of marine management (Marine Strategy Directive 2008/56/EC), the Mimer offshore wind farm project may have transboundary impacts on fish, marine mammals and birds on the Finnish side. For example, underwater noise generated during construction may have an impact on fish and seals. Noise during operation, together with the flicker effect and electromagnetic radiation, may also have an impact on the behaviour of migratory fish, for example. However, the Centre for Economic Development, Transport and the Environment of Lapland considers that it is impossible to assess the significance of the impacts at this stage based on the consultation document.

The Centre for Economic Development, Transport and the Environment for Lapland considers that it is important to assess the cumulative impacts of the offshore wind power projects planned for the Bothnian Sea area in the EIA procedure. Several offshore wind farm projects are planned for the Swedish side of the Bothnian Sea, and their combined impacts must be investigated. Based on recent modelling research (Arneborg et al 2024), large-scale offshore wind power construction may have an impact on hydrographic factors such as temperature, salinity, currents and stratification. This may cause the halocline to shift towards the surface and salinity and temperature to rise at greater depths due to wind attenuation behind the wind farm, leading to reduced mixing. According to the Centre for Economic Development, Transport and the Environment for Lapland, this may have wider impacts on the entire Gulf of Bothnia's food webs and eutrophication, and the effects will probably also be reflected in Finland.

Birdlife and Natura 2000 areas

As the regional nature conservation authority, the Centre for Economic Development, Transport and the Environment for Lapland focuses on the obstacles, disturbances and collision impacts



on migratory birds in relation to offshore wind power projects in the Gulf of Bothnia. The Centre for Economic Development, Transport and the Environment for Lapland considers that the assessment programme has identified several wind power projects located in the vicinity of the project with which the project is likely to have cumulative effects through the aforementioned impact mechanisms.

The Centre for Economic Development, Transport and the Environment for Lapland states that the migration route of species listed in Annex I of the Birds Directive and other bird species protected under Natura 2000 areas runs along the Gulf of Bothnia between southern wintering areas and northern breeding areas. Many species and species groups that are sensitive to the impacts of wind power, such as large waterfowl, loons (Gaviiformes) and many diurnal birds of prey, are listed as species that form the basis for the protection of Lapland's Natura 2000 areas. The Centre for Economic Development, Transport and the Environment for Lapland considers that offshore wind power projects in southern Lapland must not weaken the species that form the basis for the protection of Natura areas, also because the combined effects with land use closer to the project site may more easily exceed the threshold for significant deterioration.

Fish stocks and fisheries

The assessment programme states that migratory birds in the vicinity of the project area and birds staying in and near the project area will be studied in the forthcoming environmental impact assessment report, which the Centre for Economic Development, Transport and the Environment for Lapland also considers necessary.

The fisheries authority of the Centre for Economic Development, Transport and the Environment for Lapland will not issue a statement on the matter. The fisheries authority of the Centre for Economic Development, Transport and the Environment for Southwest Finland is responsible for monitoring fisheries interests in this project.

Finland's participation in the EIA procedure

The Centre for Economic Development, Transport and the Environment for Lapland considers that Finland should participate in the environmental impact assessment procedure for the Mimer offshore wind farm planned for the Swedish exclusive economic zone.

Taking the statement into account in the EIA procedure of Sweden

The Centre for Economic Development, Transport and the Environment for Lapland requires that the above statement be considered in the environmental impact assessment procedure for the Mimer offshore wind farm in Sweden.

Arneborg, L., Pemberton, P., Grivault, N., Axell, L., Saraiva, S., Mulder, E. & Fredriksson, S. 2024. Hydrographic effects in Swedish waters of future offshore wind power scenarios.

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

In the opinion of the Centre for Economic Development, Transport and the Environment for South Ostrobothnia Finland should participate in the EIA procedure of the Mimer offshore wind power project, as the project is likely to have transboundary impacts.

Several offshore wind projects are planned for the area, and at least their cumulative impacts may extend to Finland. Based on the consultation document, Mimer is bordered by Skyborn



Renewables' planned Eyrasalt offshore wind farm to the northeast and Statkraft Bothnia Offshore's Lambda offshore wind farm to the west. The closest wind farm to the southwest is Svea Vind's planned Sylen offshore wind farm, and to the west of Sylen, Salt Offshore's Hudiksvall offshore wind power project and Svea Vind's planned Greta Klackar 1 and 2 projects. Fyrskeppet and Sigma are not mentioned but are shown in Figure 46 (figure included in the original statement) of the document.

The projects are located very close to each other and would form a north-south zone approximately 200 kilometres long in the middle of the Bothnian Sea. This zone would reduce wind speeds, increase turbulence and change wind directions. This could have various indirect effects, for example on water stratification and currents. The Mimer project would also fill the empty space between the projects in this zone, which could intensify the combined effects.

The impacts of the zone on the hydrodynamics and ecology of the Bothnian Sea could be significant. The construction phase of the above-mentioned projects would last an estimated 10–15 years, during which time the nature of the Bothnian Sea would be disturbed extensively and continuously. For example, the construction noise and turbidity caused by the Mimer project may affect the marine environment in different years than neighbouring projects. The impacts of noise and turbidity on the ecosystem are likely to be cumulative or even multiplicative if they occur in consecutive years.

The impacts of offshore wind power areas may cause changes in fish production, the composition of algae species and the behaviour of migratory fish, among other things. The project is likely to affect the Baltic herring (*Clupea harengus membras*) spawning grounds in the Eyrasaltbanken shoal, which may be significant for the entire Baltic herring stock in the Bothnian Sea. Baltic herring is a key species in the Bothnian Sea.

The planned studies are listed in Chapter 8. The studies are good, but unfortunately more detailed information about them is lacking (methodology, number of samples, study area, etc.). It is important that the studies are sufficiently detailed and comprehensive to identify significant impacts in the Finnish side of the border as well. The Centre for Economic Development, Transport and the Environment for South Ostrobothnia proposes the following additions to the research programme:

- Sediment dispersion is modelled for different flow conditions, and flow measurements are carried out at the seabed station for at least one year as a basis for the modelling.
- Hydrographic impacts will be investigated using models covering at least 10 years at the level of the Bothnian Sea. The models will consider the combined effects with other projects that have already applied for permits.
- Regarding salinity, the cumulative impact of the 10-year research period will be considered.

Chapter 7 mentions that possible cumulative impacts will be investigated during the consultation and the research phase and described in the environmental impact assessment report. The document lacks information on what will be investigated and how.

The risk of spreading invasive species must be addressed in the assessment report. The project also investigates the possibilities to build platforms for energy storage and/or conversion. The impacts of this function, such as heat emissions, should be assessed in the report. The Centre for Economic Development, Transport and Environment for South Ostrobothnia points out that the environmental impacts of potential hydrogen production differ from the environmental impacts of wind power.

The assessment report should include also preliminary proposals for monitoring environmental impacts.



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

Finland should participate in the environmental impact assessment procedure.

From Finland's perspective, the most significant environmental impacts of the project are likely to affect bat species and birdlife migrating through the area, fish stocks, marine mammals and the Baltic Sea nature conservation network, particularly through the Baltic Sea Natura conservation network as a whole. Numerous offshore wind power projects are planned for Swedish territorial waters, and the cumulative effects of these projects will be very significant for the natural environment.

The assessment should also address the project's transboundary impacts. Numerous offshore wind power projects are planned in the Baltic Sea Natura conservation network area and in the vicinity of the project, and the EIA procedure should also focus on the cumulative impacts of the projects in terms of the objectives of the Natura conservation network. The impacts of underwater noise caused by the construction of offshore wind farms are often far-reaching, and it would be advisable to address noise mitigation methods in the EIA procedure. It is important that the impacts on organisms migrating through the area, such as birds and bats, are also examined in terms of their cumulative effects with other wind power projects in the Baltic Sea.

The plan for assessing the project's environmental impact appears to be well targeted and appropriate, although the matter has been dealt with in rather general terms. Furthermore, the planned studies are not described in sufficient detail in the document to ascertain their comprehensiveness. The Centre for Economic Development, Transport and Environment for Southwest Finland recommends that the project developer refer to the standard widely used in the Baltic Sea by the Federal Maritime and Hydrographic Agency of Germany (Bundesamt für Seeschifffahrt und Hydrographie, 2013, Investigation of the Impacts of Offshore Wind Turbines on the Marine Environment (StUK4), BSH-Nr. 7003).

The document does not specifically address transboundary impacts. To facilitate international consultation, it would be advisable to identify these impacts separately and to carry out a detailed assessment from this perspective as well. Several offshore wind farms are planned for the area surrounding the project, which means that their combined impacts may extend beyond national borders. Such cumulative transboundary impacts may affect marine mammals, birds, fish and underwater noise levels. Possible changes in water flow conditions and their effects on the marine environment should also be considered.

In the EIA process, environmental impacts should be examined in relation to the objectives of good status set out in Sweden's national marine strategy plan (which implements the Marine Strategy Framework Directive) and the Baltic Sea Action Plan.

The assessment should examine separately the impacts during construction and during operation. It is also important to explain how the studies and assessments have been carried out.



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

- Fisheries Authority

According to the view of the fisheries authority of the Centre for Economic Development, Transport and the Environment for Southwest Finland, Finland should participate in the EIA procedure for the Mimer offshore wind farm project because the transboundary impacts of the project also extend to Finnish territory, particularly due to the impacts on Baltic herring stocks (*Clupea harengus membras*) and commercial fishing.

Fish stocks

The construction of offshore wind power projects significantly alters the natural environment of the open sea. Regarding Baltic herring (*Clupea harengus membras*), it is significant that the sea areas close to the spawning grounds will be transformed into construction sites for several years.

The Mimer offshore wind farm project is located in the sea area south and southwest of the Eystrasalt shoal, which is a Baltic herring spawning ground. At their closest, the wind turbines will be located only about two kilometres from Eystrasalt shoal.

The noise generated during the construction of the offshore wind farm may kill and injure Baltic herring. The noise disturbs the migratory behaviour of herring and drives them away from the Eystrasalt spawning grounds during the breeding season. Noise can disrupt the migratory behaviour of Baltic herring and the gathering of spawning shoals on the slopes of shoals near spawning grounds. Noise can harm fish heading for spawning grounds. Both noise and sediment deposited in spawning grounds because of construction work can disrupt spawning and reduce the survival rate of roe, affecting the entire spawning stock in the area.

Construction work weakens Baltic herring reproduction in the surrounding area. The problem is exacerbated if construction work continues in the surrounding area for several years, which can cause the population to collapse. A buffer zone of at least 5 kilometres must be left between spawning shoal and wind turbines to minimise the adverse effects.

The disturbance caused by construction work can affect the fish community, species structure and individual numbers of species that move around and feed in the entire area. Potential impacts also affect species that migrate long distances, such as salmon (*Salmo salar*), trout (*Salmo trutta*) and common whitefish (*Coregonus lavaretus*).

Fishing

The impacts on Baltic herring will be reflected in commercial fishing in the area. Both Finnish and Swedish trawlers operate in the vicinity of OWF Mimer. Noise may drive herring away from their usual habitats, making them more difficult to catch, which will affect the profitability of trawl fishing. It is possible that fishing will be unprofitable throughout the construction period in the entire fishing area and beyond.

During construction work, various construction vessels will be operating in the area. Maritime traffic unrelated to construction work may be restricted, thereby hindering fishing.

Looking at the project area itself, most of it has no significance to commercial fishing. According to Swedish trawl data, only two trawl lines have passed through Mimer, apparently in 2021. However, in the south-eastern and north-western corners of Mimer, the project area extends into areas that are actively used for fishing, causing serious conflicts with commercial fishing.



Baltic herring trawling is carried out where fish shoals move and where the seabed conditions are favourable, i.e. where there is no risk of the trawl getting stuck and damaged. As a result, trawlers operate in specific areas and along established and safe trawling routes that have proven to be effective. Fishermen can safely adjust the depth of the trawl according to how deep the fish shoals are swimming, sometimes deeper, sometimes closer to the surface.

The location of the project area on top of the trawling area cuts off the existing trawling routes, leading to the loss of fishing areas. A trawler cannot move its route further away if a wind turbine or other structure is built in the area, if the seabed profile does not allow for avoidance. Cutting off the trawling route, in turn, may result in the entire trawling area or part of it having to be completely abandoned. It may be possible to move to other areas, but this will lead to increased fishing pressure in those areas. Finding new, replacement trawling routes is currently unlikely. From the point of view of fisheries, maintaining the current trawling routes is essential to secure the conditions for trawling.

The location of the wind farm must be limited so that there is a buffer zone of at least 3 kilometres between the outermost wind turbines and the nearby trawling routes. The buffer zone will allow trawling to continue on the existing routes and will prevent conflicts between power generation and commercial fishing. Trawlers will be able to safely pass the wind farm area even in challenging wind and current conditions, minimising the risk of damage to fishing gear.

The cables should also be positioned in such a way that conflicts with the interests of the fishing industry are minimised.

Which issues rise considering the assessment programme

Fish stocks

There are gaps in the given material concerning the information on fish stocks. A more detailed study is needed, for example, using eDNA research and test fishing. The impact of construction work on the migration of salmon, trout and common whitefish must be investigated.

According to the consultation document, there are no Baltic herring spawning grounds in the vicinity of the project area. However, there is very little information available on the spawning stocks of Baltic herring in the open sea, as the estimates are based on modelling rather than field studies. The use of models presumably underestimates the area of Baltic herring spawning grounds, partly because spawning in the open sea occurs at greater depths than on the coast. Clearly, more information is needed on Baltic herring spawning grounds, which should be mapped in the vicinity of the Mimer wind farm. At least on the Finnish side, environmental changes and eutrophication of coastal areas have reduced the spawning opportunities for Baltic herring. Mapping and protecting Baltic herring spawning grounds in the open sea is necessary to ensure the vitality of Baltic herring stocks.

Fishing

The assessment report must provide a comprehensive summary of the volume of trawl fishing, catches, fishing locations, fishing seasons, catches and trawling corridors used for both Finnish and Swedish fishing. VMS data for Finnish trawlers is available from the fisheries authorities at the Centre for Economic Development, Transport and the Environment for Southwest Finland (registratur.egentligafinland@nmt-centralen.fi).

The report should outline the technical implementation of trawl fishing, identify the space required for trawl fishing and its other special needs. The regional boundaries of the wind power project should be changed so that trawl fishing can continue in the area as at present.



Technical implementation of the work, turbidity and noise

The consultation document does not describe the structure of the foundations of the wind turbines planned for the area, other than to say that the foundations will be built on the seabed and that they will be installed in accordance with the selected foundation type. The construction process is only outlined at a general level. As a result, the impacts during construction are also dealt with rather superficially.

The work will include some or all the following measures: seabed modification, dredging, piling, drilling and possibly also blasting. These measures will cause turbidity in the water and increase the sedimentation of solids on the seabed and in shallow areas. The work will cause noise that will scare away, harm and even kill fish.

The spread and impact area of both turbidity and noise must be determined using modelling. When modelling sediment dispersion, it must be considered that the suspended solids concentration in the open sea in the Bothnian Sea is generally less than 1 mg/l. Modelling of pile driving noise propagation must be carried out both with and without noise mitigation measures. The variables to be examined in noise propagation modelling are behavioural changes in fish, temporary hearing damage, permanent hearing damage and death.

The results of the modelling should be presented in concrete terms on maps with a scale that also shows the Finnish coast. The maps should show the areas where fish are affected by the above-mentioned adverse effects, both with and without noise mitigation measures. Based on the assessment, it should be possible to evaluate, for example, the areas where noise will affect fish behaviour and where fishing is likely to become more difficult due to the escape behaviour of fish.

The assessment report must examine and evaluate the effectiveness of the bubble curtain as a noise attenuator. Do the bubbles form a dense noise barrier in different flow conditions if the water column is 50 metres high? How does noise behave in water if several foundations are being constructed at the same time?

The assessment report should also address the cumulative effects that will arise if the many offshore wind farms planned for the Bothnian Sea are implemented, in terms of both temporary and permanent adverse effects.

Finnish-Swedish Transboundary River Commission

Although the location of the project is outside the geographical scope of the Agreement between Finland and Sweden concerning transboundary rivers between Sweden and Finland (Prop 2009/10:212), the project may have an impact that extends to the Torne River through its impact on migratory fish. Salmon (*Salmo salar*) from the Torne River migrate all the way to the southern Baltic Sea and may therefore cross the project area or the submarine cables that carry the electricity produced to land. According to the purpose of the Transboundary River Agreement, Special attention shall be paid to conservation and sustainable exploitation of fish stocks. (Art. 2.2.d).

Potential impact on migratory fish and cumulative effects

At the time of writing, there is still limited knowledge about the potential impact of offshore wind power on migratory fish stocks. Given the large amount of planned offshore wind power in the Baltic Sea and the Gulf of Bothnia, the Transboundary River Commission considers it important to act in accordance with the precautionary principle and thoroughly investigate the possible combined and cumulative impact on migratory fish stocks from all planned wind power projects in the entire Baltic Sea region as a whole. With reference to Article 66 (1) of the UN Convention



on the Law of the Sea, the Commission points out that "States in whose rivers anadromous stocks originate shall have the primary interest in and responsibility for such stocks.". Finland and Sweden, as states of origin under the Convention on the Law of the Sea, must ensure that the construction or production of offshore wind power does not have a negative impact on salmon stocks in the Torne and Kalix rivers. The construction could have transboundary effects, which must be considered in the impact assessment.

Lack of knowledge about salmon migration patterns

The Transboundary River Commission notes that knowledge of salmon migration patterns is still limited. Available information on spawning migration is based on catch data, i.e. information about where salmon have been caught. This does not describe which other areas salmon use during their migration or, conversely, which areas they do not use.

Even less information is available on smolt migration. Given the lack of knowledge, the Commission emphasises that more comprehensive information on the migration patterns of migratory fish is needed to assess possible impacts.

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

Natural Resources Institute Finland

The project may have environmental impacts extending to Finland, and therefore Finland's participation in the EIA procedure would be justified. The risk of significant impacts, and in particular cumulative impacts, increases if several large wind power areas are built in the Bothnian Sea area.

Finnish trawlers also fish for Baltic herring (*Clupea harengus membras*) to some extent in the project area and its immediate surroundings. This should also be considered in the environmental impact assessment of the project. There are numerous large-scale offshore wind power projects underway in the Bothnian Sea, both in the Swedish and Finnish exclusive economic zones and territorial waters. If the construction of offshore wind power in the Bothnian Sea is implemented on a large scale, wind power may also have negative cumulative impacts on birds or migratory fish, for example, which cannot be adequately considered in the environmental impact assessments of individual projects.

The consultation document provides little information on how the potential impacts on fishing, fish, migratory birds and marine mammals would be assessed in the environmental impact assessment. The consultation document is apparently not a translation of the project's environmental impact assessment programme?

At present, the overall planning of offshore wind power in the Gulf of Bothnia is not clearly under the control of any single authority, and the anticipation of cumulative combined impacts is proving to be weak. Natural Resources Institute Finland therefore considers that the cumulative impacts and location of offshore wind power in the Gulf of Bothnia should be examined as a whole in cooperation with Sweden. Predicting cumulative impacts would also require the collection and analysis of new source material from the Gulf of Bothnia area.



Regional Council of Satakunta

The Regional Council of Satakunta considers that the environmental impact assessment procedure of the Mimer offshore wind farm planned in Sweden's exclusive economic zone should consider the Maritime Spatial Plan of Finland 2030, which was approved at the end of 2020. The Finnish Maritime Spatial Plan 2030 identifies potential areas for the development of offshore wind power. The Finnish Maritime Spatial Plan 2030 has no legal effect, but its impact is based on extensive stakeholder cooperation and coordination between different sectors.

The planning of offshore wind power in the Gulf of Bothnia and the Bothnian Sea has increased significantly in recent years. In Sweden's maritime spatial plan (<https://www.havochvatten.se/planering-forvaltning-och-samverkan/havsplanering/granskning-av-forslag-till-andrade-havsplaner/forslag-till-andrade-havsplaner.html>) several new extensive areas with potential for offshore wind power have been planned for the Bothnian Sea. Work has also begun on updating Finland's maritime spatial plan 2030, with the aim of having the regional councils of Finland's coast draw up a new maritime spatial plan by the end of 2026. The update is driven by many changes in the maritime operating environment since the first plan was drawn up, as well as numerous national and EU-level agreements and targets that pose new challenges for industries and the planning process. These include, among other things, the 30% marine area protection target set by the biodiversity strategy, the fisheries growth targets in line with the domestic fish promotion programme, the development of offshore wind power, overall safety issues and the changing needs of maritime transport.

Although the planning area is more than 100 kilometres from the Finnish coast, Regional Council of Satakunta believes that the EIA process for the Mimer offshore wind farm project should also consider the potential impacts on Finnish marine areas. The impacts on birdlife and fish stocks, among other things, must be investigated and assessed over a wider area than the actual project area. The Gulf of Bothnia is an important habitat and migration route for birds, and the status of fish stocks affects the entire Bothnian Sea and Gulf of Bothnia. In addition to the fishing industry, the impact assessment should pay particular attention to shipping and consider the varying ice conditions in the Bothnian Sea. The combined effects of the offshore wind power projects planned for the Bothnian Sea should also be examined, as there are several other offshore wind power areas in the planning stage near the Mimer project.

As offshore wind power has an impact on other uses of the sea and important livelihoods in the Bothnian Sea, such as shipping and fishing, as well as on the environment and natural ecosystems, there is a clear need to coordinate the planning of projects throughout the Gulf of Bothnia. Energy transmission related to offshore wind power also has an impact on the environment, ecosystems and land use in continental areas. To support controlled development and assess the overall impact, cooperation between countries must be further intensified.

The Regional Council of Satakunta considers it necessary for Finland to participate in the environmental impact assessment procedure for the Mimer offshore wind power project planned for the Swedish economic zone for the reasons mentioned above. In addition, the Regional Council of Satakunta emphasises the importance of an open, interactive and sufficiently broad assessment process in large offshore wind power projects. The Regional Council of Satakunta does not consider it necessary to participate in, for example, events related to EIA procedure, but it wants to be aware of the progress of the process, for example through the maritime spatial planning coordination group.



Finnish Transport and Communications Agency Traficom

A significant number of offshore wind power projects are planned for the Gulf of Bothnia in both Finland and Sweden. If implemented, these large offshore wind farms, which are located close to each other, could have a significant impact on shipping in the Gulf of Bothnia in terms of both safety and traffic flow.

When defining the area of the planned Mimer offshore wind farm, it is important to consider the shipping routes used by maritime traffic, including those outside the established fairways and routing systems, so that the operating conditions and safety of maritime traffic in the vicinity of the planned project area are considered. The potential combined effects of the offshore wind power projects surrounding the project area on maritime traffic in the area should also be thoroughly investigated during further planning. Large offshore wind farms located close to each other may concentrate and change shipping routes, which is important to consider when assessing the impacts.

When planning the location of offshore wind farms and individual wind turbines, consideration must be given to the use of radar as the primary navigation and collision avoidance tool for ships and its key role in traffic control.

Wind turbines can cause either shadowing or reflection effects on maritime radars, which at worst can make it difficult to interpret radar signals. Wind farms can also affect the satellite positioning of vessels, i.e. the Global Navigation Satellite System (GNSS), by reflecting satellite signals through wind turbines, causing incorrect positioning for vessels using the system.

Electronic communications in coastal and marine areas are dependent on radio systems. In offshore wind power projects — and especially in the later stages of planning the location of individual wind turbines — it is important to consider the potential impact of wind turbines on maritime and coastal radio systems. The operation of radio links in maritime areas requires unobstructed communication between the transmitter and receiver. Even small changes in the location of the power plants can have a decisive impact on the operation of radio systems in the area.

The reliable operation of radar, positioning and radio systems is an essential part of maintaining maritime and general safety. Therefore, any potential impacts on their operations should be assessed to ensure that the operating conditions of the systems are not compromised.

In the planning of the proposed Mimer offshore wind farm, it would be important to consider the views and prerequisites of the rescue authorities to ensure that adequate conditions for maritime rescue and environmental damage prevention in the area can be maintained even after the offshore wind farm is completed.

In Traficom's view, it would be justified for Finland to participate in the EIA procedure for the planned project, as the location of the project area and other offshore wind power projects planned in its vicinity may also affect shipping to and from Finland.

Finnish Border Guard

The Finnish Border Guard has reviewed the Finnish Environment Institute's request for a statement concerning participation in the environmental impact assessment (EIA) procedure for the Mimer offshore wind farm planned for Sweden's exclusive economic zone.



- The Mimer offshore wind farm is located very close to other offshore wind power projects planned for the area and to routes regularly used by maritime traffic. The impact of offshore wind farms on maritime traffic should be examined in the EIA procedure, considering the combined impact of adjacent offshore wind farms (including those located on the Finnish side).

As maritime traffic is channeled into narrow fairways between offshore wind farms, the risk of ship accidents increases, for example due to reduced encounter distances. In addition, in problem situations, ships are at risk of drifting into offshore wind farms.

- Considering the location of the Mimer offshore wind farm and the cooperation between Sweden and Finland in maritime rescue, the placement of wind turbines should consider the ability of both countries' maritime rescue authorities to operate rescue helicopters in life-saving missions within the farm, even in poor conditions. The distances between individual wind turbines should be sufficiently large from the point of view of flight operations, and the turbines should be placed in straight lines in accordance with international practice. Cooperation with rescue authorities is essential in the EIA procedure.
- A single wind turbine may contain 20,000–25,000 litres of oil and chemicals. In the event of a collision or technical failure, this amount could cause significant environmental damage. This must be considered in the EIA procedure. The operator of an offshore wind farm (as well as the builder and dismantler) must have sufficient capacity to prevent and combat potential environmental damage, as the authorities' resources are located relatively far from offshore wind farm areas. Environmental damage can have transboundary effects.
- Offshore wind farms cause interference with marine navigation, GNSS signal accuracy, VHF radio communications and AIS systems. These have an impact on maritime safety and the activities of the authorities (e.g. the effectiveness of maritime rescue or environmental damage prevention measures). The need for compensatory measures must be identified in good time and considered in the planning of offshore wind farms.

In the view of the Finnish Border Guard, taking the above points into account, it is justified for Finland to participate in the EIA procedure for the Mimer offshore wind farm.

Finnish Shipowners' Association

The Finnish Shipowners' Association appreciates the opportunity to comment on the need to participate in the environmental impact assessment procedure for the Mimer offshore wind farm planned for the Swedish exclusive economic zone. In our view, Finland should participate in the EIA procedure for the planned project.

We note that a significant number of offshore wind power projects are planned for the Gulf of Bothnia in both Finland and Sweden. Large offshore wind farms, especially those located close to each other, can have a significant impact on shipping in terms of both safety and smoothness. During further planning, the potential combined effects of the offshore wind power projects surrounding the project area on maritime traffic in the area should be thoroughly investigated.

We also note that the potential impacts on the operation of radar, positioning and radio systems should be assessed to ensure that the operating conditions of these systems are not compromised. The reliable operation of these systems is an essential part of maritime safety.



Finnish Meteorological Institute

The Finnish Meteorological Institute considers that Finland should participate in the EIA procedure so that the impacts of the offshore wind farms to be built in the Bothnian Sea can be coordinated comprehensively.

The Finnish Meteorological Institute has reviewed the EIA programme and considers that the offshore wind farm will not have a significant impact on the Finnish Meteorological Institute's own weather radar network, as the area is more than 20 kilometres away from the nearest weather radar.

Regarding physical marine research, the Finnish Meteorological Institute considers that the impacts on the physics of the sea in Finnish territorial waters (directly or indirectly) will be minor.

The Finnish Meteorological Institute considers the EIA programme to be comprehensive. However, as with other project developers, the Finnish Meteorological Institute points out that infrastructure built at sea may complicate the monitoring of the Baltic Sea (e.g. measurements required by the EU Marine Strategy Framework Directive). The EIA programme does not specify whether there will be monitoring points in the wind park area. In addition to measurements taken from ships, the Finnish Meteorological Institute uses Argo buoys that drift freely in the Bothnian Sea and may drift into the wind park area. Due to these potential impacts, the Finnish Meteorological Institute hopes that, when constructing the park, the project developer will cooperate with maritime operators such as the Finnish Meteorological Institute, SMHI and the Finnish Environment Institute to investigate whether it is possible to establish a measuring station in the wind park area to replace and supplement the maritime data obtained from the Bothnian Sea.

Finnish Heritage Agency

The Finnish Heritage Agency will comment on the matter from the perspective of underwater cultural heritage.

In the experience of the Finnish Heritage Agency, underwater cultural heritage sites associated with offshore construction projects are primarily shipwrecks, which may have historical connections to different countries. International exchange of information on wrecks and their protection and research is a common practice, which is a prerequisite for understanding the background of the sites and promoting their protection. However, underwater cultural heritage sites are physical remains located in a specific limited area, and the mapping, protection and research activities carried out on them do not have any actual transboundary environmental impacts. The status of underwater cultural heritage in the project area must be investigated in connection with the preparation of hydraulic engineering projects, if necessary, and any harmful effects must be mitigated. The Swedish cultural environment authorities are responsible for ensuring that this is done in Swedish territorial waters and the exclusive economic zone.

From the perspective of underwater cultural heritage, Finland does not need to participate in the EIA procedure for the Mimer offshore wind farm project planned for Sweden's exclusive economic zone.

Finnish Safety and Chemicals Agency (Tukes)

Within the scope of the Finnish Safety and Chemicals Agency's (Tukes) authority, there is no need to participate in the EIA procedure concerning the project.



The Government of Åland

There is no need for Åland to participate in the environmental impact assessment procedure. The Government of Åland therefore does not wish to take part in future proceedings in this matter. No direct effects are expected to arise for Åland due to the great distance involved.

Regional Council of Southwest Finland did not have any comment on the matter.

Participation in the transboundary EIA procedure

Based on the received statements and reflecting its own views, the Finnish Environment Institute states in accordance with Article 3(3) of the Espoo Convention that Finland intends to participate in the transboundary EIA procedure of the offshore windfarm Mimer.

Conclusions

The Finnish Environment Institute considers that it is important to examine and assess all the impacts mentioned in the comments. Finnish Environment Institute notes that the transboundary impacts of the project are not addressed in the materials or distance to Finnish exclusive economic zone mentioned. The transboundary impacts on Finnish side of the border should be assessed in the EIA of the Mimer offshore wind farm.

The main concerns involve the impacts on Baltic herring, migrating birds, fishing and security and safety issues. The environmental impacts of construction noise and water turbidity as well as other hydrographic effects must be assessed in sufficient detail. Environmental impacts should be assessed in relation to the objectives set out in Sweden's national marine strategy plan (which implements the Marine Strategy Framework Directive) and the Baltic Sea Action Plan.

The combined effects of the planned Mimer offshore wind farm and the existing and planned wind farms in proximity must be considered in the Environmental Impact Assessment of the Mimer offshore wind farm project. Several wind farm projects are planned in close vicinity of each other. It is essential to take also the security and safety points into consideration. The hydrographic factors and other possible cumulative impacts for example on fish, fishing and migrating birds as well as on marine ecosystems must be assessed.

To conclude, the Finnish Environment Institute requires that the EIA documentation will provide a transboundary environmental impact assessment from Finland's perspective with a specific regard for the provided statements.



Head of Services

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

Appendices

Received statements in Finland

For information

Ministry for Foreign Affairs
Ministry of the Environment
Centre for Economic Development, Transport, and the Environment
for Lapland
Centre for Economic Development, Transport, and the Environment
for South Ostrobothnia
Centre for Economic Development, Transport, and the Environment
for Southwest Finland
Centre for Economic Development, Transport and the Environment
for Southwest Finland - Fisheries Authority
Finnish-Swedish Transboundary River Commission
Natural Resources Institute Finland
Regional Council of Satakunta
Finnish Transport and Communications Agency Traficom
Finnish Border Guard
Finnish Shipowners' Association
Finnish Meteorological Institute
Finnish Heritage Agency
Finnish Safety and Chemicals Agency (Tukes)
The Government of Åland
Regional Council of Southwest Finland

