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

The Finnish Environment Institute acknowledges that Finland has received the consultation request from Sweden on 14 November 2024, in accordance with Articles 4 and 5 of the Espoo Convention to submit comments on the permit application and the environmental impact assessment (EIA) for the offshore windfarm Sylen.

Previously, Sweden notified Finland of the EIA programme for the offshore windfarm Sylen in accordance with Article 3 of the Espoo Convention on 31 November 2023. As a response to the notification, the Finnish Environment institute replied on 8 December 2023 in accordance with Article 3, Paragraph 3 of the Espoo Convention that Finland intends to participate in the EIA procedure of the planned project.

Consultation in Finland

In accordance with Section 30 (911/2022), Subsection 1 of the Finnish Act on Environmental Impact Assessment (252/2017), the Finnish Environment Institute is the competent authority and responsible for tasks under the Espoo Convention when a project in a party of the treaty or a Member State of the European Union may have significant transboundary impacts in Finland. The Swedish Environmental Protection Agency requested to provide comments concerning the assessment of the environmental impacts of the project affecting Finland and submit comments from the public and the authorities in Finland.

The public and the authorities were given the opportunity to comment on the consultation documents from 21 November 2024 to 3 January 2025, which were available on the website of Finland's environmental administration and on the website of lausuntopalvelu.fi. Statements were also asked from relevant stakeholders.

Remarks received during the consultation

The Finnish Environment Institute received 15 statements. The Finnish Environment Institute has prepared a summary of the original statements in English below. However, the original



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

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

The Centre for Economic Development, Transport and the Environment of South Ostrobothnia (ELY Centre of South Ostrobothnia) considers that the biological and hydrological surveys carried out during the EIA procedure for the project are insufficient. The combined effects have not been sufficiently assessed. The level of marine nature surveys is low compared to similar projects.

Marine biological surveys

The project area has not been surveyed from a biological perspective. The area is a pristine, shallow area of the open sea, part of which is located in the photic zone. The area is of importance for the spawning of the key species Baltic herring (*Clupea harengus membras*) and for the conservation of the native species of the Bothnian Sea. Given that the project would cover an entire shallow area, the mapping of the area should have been conducted with greater precision. Qualitative problems have been identified in the underwater camera survey. Blue mussels (*Mytilus spp.*) had not been detected. Blue mussels are common in the Bothnian Sea and have been detected in offshore banks, for instance in Finngrundet, Eyrasaltbanken and Sylen swallow (artfakta.se, helcom.fi), which is located just a few kilometres south of the project area. There are suitable seabeds for the species, and the larvae are able to inhabit the area annually. The mussel is a key species that is important for water quality, fish, and birds. The absence of the species in the assessment and the lack of addressing the issue raise questions about the quality of the report. The report also includes a picture of a filamentous algae, which experienced surveyors believe to be *Cordylophora caspia*. The pictures also show a possible bay barnacle (*Amphibalanus improvisus*), but the species is not mentioned in the text, although it has been recorded in the area before (Naturvårdsverket, 2010, rapport 6385). The fish fauna in the area has not been successfully surveyed. The literature review provided is not optimally suited.

Hydrological surveys

The ELY Centre of South Ostrobothnia considers it a significant shortcoming that the hydrological surveys and their measurement are not presented. Furthermore, the sea current data on which the sediment modelling is based is not presented.

Heat emissions

The condensate water from transformers or other possible thermal emissions has not been presented, nor has their impacts been assessed.

Changes in sea current conditions

The project's impact on wind and sea current conditions has not been modelled either. Modelling has been a requirement in Finland's response to the EIA programme and has been provided in EIA procedures for similar projects. The absence of such modelling represents a significant shortcoming. According to the modelling, the adjacent project will have an impact on sea current conditions and chemical-physical factors also on the Finnish side. Two of Sylen's neighbouring projects have already applied for permits before Sylen, so it is possible that they



will be granted a permit earlier. In that case, the combined effects of these projects need to be examined.

Piling noise propagation

The results of the modelling are clearly illustrated on the maps. Modelling and comparing multiple mitigation measures would have improved the utility of the modelling.

Invasive alien species

The report has not identified the project's heightened risk of invasive species, nor has addressed mitigation measures.

Impact assessment of the project

In the international waters of the Bothnian Sea (Finnish and Swedish Exclusive Economic Zones), permits have been applied for three offshore windfarms, Sylen, Fyrskeppet and Eyrasalt. These projects are located in close proximity to each other, forming a north-south oriented zone, approximately 120 km long, in the middle of the open sea of the Bothnian Sea. This zone would reduce wind speeds, increase turbulence and change wind directions. For Sylen, the wind impact has not been modelled, but for the individual windfarm area of Fyrskeppet, the wind impacts have been modelled to cause small, practically insignificant changes in currents also along the Finnish coast. The ELY Centre estimates that the combined effects of offshore wind projects increase logarithmically as the wind power area expands. The combined effect of these three areas could therefore cause significant changes in Finnish waters. This is confirmed by the fact that the sites are located in a straight line, one after the other, with less than 30 km of unbuilt marine area between them. The direct wind wake (vindvak) of a modern offshore windfarm is estimated to extend approximately 30 kilometres below the wind. Project areas located in close proximity to each other in the open sea can be considered as a single area with regard to wind impact. As the Sylen site is located between Eyrasalt and Fyrskeppet, it may potentially amplify the sea current effects of these projects.

It is important to note that heat emissions also have an impact on hydrology. Furthermore, heat emissions have the potential to contribute to the introduction of invasive species. In the case of Sylen, heat emissions are not presented, but presumably the hydrological impact is negligible. The potential impact of alien species could be significant for Finland, particularly if mitigation measures are not implemented.

According to the modelling, the impact of construction noise extends to the Finnish side and changes in fish behaviour can affect the entire Gulf of Bothnia ecosystem. The significance of the impact increases through combined effects, as the simultaneous construction of several projects in different areas can disturb fish in the entire Bothnian Sea. Furthermore, given that the projects will be constructed at different times, the noise impact over tens of kilometres will not be temporary. The noise may continue in the same sea area for many years. There is a high risk that this will have a negative impact on fish stocks and the ecosystem. Noise control should be taken seriously, and the coordination of the schedules between projects in Sweden and Finland will be the most important mitigation measure.

Direct ecological impacts on the Finnish marine biota may occur through the food web if there are large populations of blue mussels or significant Baltic herring spawning areas (both key species). This potential impact has not been thoroughly investigated, but the ELY Centre considers the risk to be low. This is due to the temporary nature of the impact and the area's estimated minor importance.



The project is not expected to have a significant positive impact on fish stocks. The anticipated reef effect is not expected to occur as the area's seabed is already mostly reef, and species benefiting the reef area are missing from the Bothnian Sea. The effect on protected areas is also likely to be negligible, as most of the area is not currently fished and such a small refuge area does not fit with the ecology of pelagic species.

Summary

As the preliminary biological studies for the project are incomplete, the impact assessment is either impossible or highly unreliable for many important factors. Some of the estimates given in the report are unrealistic or unjustified. The quality of the preliminary studies clearly falls short of the standards seen in the EIA procedures for similar projects in Sweden and other countries in the Gulf of Bothnia and the Baltic Sea. The opinions submitted from Finland have not been given sufficient consideration.

The ELY Centre estimates that the significant combined effects of this project and the other projects for which a permit has been applied may extend as far as Finnish territorial waters. Permanent significant impacts may result from the impact of the projects on wind and affect currents, the physio-chemical characteristics of surface and coastal waters and the entire ecosystems. Temporary impacts extending into Finland may be due to sediment clouds during the construction phase and noise impacts. Significance depends on the timing of this and other projects.

The ELY Centre considers that the permit application must be supplemented by the above-mentioned preliminary studies. Specifically, a sea current modelling study covering the combined effects must be carried out. The other project in the permitting phase must be considered in the additional studies.

The most effective methods of preventing the spread of construction noise and sediment clouds must be utilised. Construction schedules should be kept to a minimum and coordinated with other permitted projects, if necessary. When considering restrictions, the rapid completion of the project may be preferable for nature.

It is essential to monitor the environmental impacts across the entire Bothnian Sea. Monitoring must start before construction begins. In order to minimise heat emissions from the project, it is essential that cooling is primarily achieved by means other than seawater cooling. In addition, an invasive species strategy must be developed for the project.

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

In terms of the nature impacts, it is the effects on fish and marine mammals that are considered to be transboundary impacts of the project. The impact is due to underwater noise during the construction phase. The Centre for Economic Development, Transport and the Environment of Southwest Finland (ELY Centre of Southwest Finland) considers reducing piling noise to be a suitable mitigating measure for the far-reaching impacts of the project. The bird impact assessment and the studies carried out for this purpose are sufficient to exclude significant transboundary impacts on birds.

In its statement on the EIA programme, the ELY Centre of Southwest Finland has also highlighted the assessment of the project's impacts on sediment transport, the current and temperature conditions in the Baltic Sea, magnetic fields, littering and the mitigation of the above-mentioned impacts.



The assessment of the effects of magnetic fields has been somewhat superficial and not with the requested level of detail. Furthermore, the mitigation of potential impacts has not been addressed in the summary of the EIA report. However, the assessment and prevention of potential oil spill risks have been conducted appropriately. The EIA summary does not include an assessment of the impacts or mitigation of micro and macro plastic entering into the sea. There are only a few mentions of thermal and current conditions and their potential impacts on areas outside the project have not been assessed.

Overall, the summary of the EIA report should have also indicated whether the impacts mentioned above have been assessed as minor or insignificant and on what the result of the impact assessment is based. The fact that these issues are addressed only in the appendices of the summary makes it difficult to gain a comprehensive understanding of the results and the adequacy of the project's impact assessment. While the planning for underwater noise mitigation is adequate, the mitigation measures for several other impacts cannot be considered effective or fully designed.

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

Fish stock

An attempt has been made to determine the fish stock in the project area based on eDNA sampling and information found in the literature. Unfortunately, the eDNA survey was a complete failure, leaving no information on the fish species present in the area. As the project area is not biologically mapped, the necessary fish biology information is not available in the literature. The use of coastal data is unlikely to give a true picture of the fish stock structure of the offshore project area. The migratory routes of fish have also not been studied. Overall, the information on fish stocks in the assessment report is very incomplete.

Instead of actually identifying Baltic herring (*Clupea harengus membras*) spawning areas, the assessment is based on the Helcom model, which does not consider the project area to be a particularly important herring spawning area, as the model suggests that there is only one small potential spawning area in the project area. Given the very limited information available on the spawning populations of offshore banks in practice, it can be assumed that the Helcom model underestimates the surface area of the herring spawning grounds, for example, because spawning occurs deeper offshore than inshore. The eDNA surveys for the Eysterasalt offshore windfarm project showed that herring DNA was also found in quite deep areas in autumn, suggesting that there are spawning areas for autumn-spawning herring in the area. Clearly, more information is needed on the potential spawning areas for herring in the Sylen windfarm area. The construction of the wind farm must not threaten the reproduction of herring in the project area.

In Finland, environmental changes and eutrophication of coastal zones have reduced the reproductive potential of herring. Mapping and protection of offshore herring spawning grounds is necessary to ensure the vitality of herring stocks.

The report estimates that the impact of fish could be positive because of the reef effect. This is unlikely as the reef effect is based on species that are rare in the Bothnian Sea. This is because the fisheries impact of the reef effect is based on species that do not exist or are rare in the Bothnian Sea.

Fishing

According to the assessment report, the impact of the project on commercial fishing is insignificant. According to the assessment, the Sylen area is not of national interest to the



Swedish State in terms of commercial fishing. Furthermore, the project would not have significant transboundary impacts according to the report. The fisheries authority of the ELY Centre for Southwest Finland views that the assessment is flawed because, if the project is carried out as planned, trawling to the south-east and south of the project area would be severely restricted.

Fishing in the open is mainly of trawling for herring. The assessment report should have provided detailed information on the extent of trawling, catches, fishing locations and fishing seasons. The source of the trawling data used in the assessment report is the catch data from the trawl hauls, with the catch and haul reported for each haul. The incomplete presentation of the trawl haul routes makes it difficult to assess impacts. The assessment report provides a map of maritime traffic routes, including fishing vessels, based on the Automatic Identification System (AIS) in 2022. However, the accuracy of the AIS information is only indicative. The assessment should have been based on VMS data, which would provide a much more accurate picture of towing route for trawl vessels, fishing activity and intensity. The data should also cover a longer period, e.g. 10 years, so that the analysis also covers inter-annual variations. VMS data are available on request from the ELY Centre for Southwest Finland.

The report should also properly outline the technical implementation of trawling, identify the space needed for trawling and its other specific needs. The trawl fishery is well established: fishing takes place at specific locations and in specific areas that have been identified as high priority for the herring trawl fishery. These areas tend to have well known trawl grounds where fish of suitable size can be caught close to the bottom without risk of trawl breakage. The siting of offshore wind farms in or close to trawl areas may mean that trawling is no longer possible in the area.

The positive effect of the project described in the report, i.e. an improvement in the condition of the seabed due to a possible reduction in trawling, does not apply in the case of the Bothnian Sea as there is no bottom trawling in the area. For pelagic species such as herring and sprat (*Sprattus sprattus*), trawls are often towed close to the bottom, but the gear is not towed along the seabed. Bottom trawling in the southern Baltic Sea targets species such as cod (*Gadus morhua*) and flounder (*Platichthys flesus*), which are not caught in the Bothnian Sea.

Summary

The lack of information on fish and fisheries in the assessment report is a serious shortcoming, as the impact of construction activities on potential spawning and on fish stocks in the area and their fisheries can be very significant. The assessment of the impact on fisheries is deficient because the negative impact of the project on Finnish trawling has not been fully identified. It should also be noted that the comments made by Finland during the EIA programme have not been sufficiently taken into account.

Fisheries Authority's assessment of the project's impact on fisheries

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

The Bothnian Sea is Finland's most important fishing area and a large proportion of the Baltic herring caught under the Finnish quota comes from the Swedish EEZ. Catches from the Bothnian Sea play an important role in Finnish fisheries. Finnish vessels have regularly fished in the area for at least 30 years. The areas around the project area are, at least occasionally, important fishing grounds for the Finnish herring fishery.



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

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

From a fisheries perspective, the location of the Sylen offshore wind farm is in principle quite good, as most of the project area itself is of little importance for commercial fishing. Only occasional trawling has been reported in the project area. However, trawling takes place immediately outside the project area, as evidenced by both the number of hauls and the routes taken by the vessels.

When defining the project area, it should have been considered that the south-east and south of the area are active trawling grounds. Outside the project area, in its immediate vicinity, there are several established trawl corridors, and it is obvious that the project area is too close to them.

Trawl passages are consistently located in certain places because the bottom profile is suitable for fishing in those places. A trawler will not be able to divert when a wind turbine or other structure is erected if the bottom profile does not allow for evasion. In turn, blocking a trawling route may mean that all or part of a particular trawling area has to be closed. It may be possible to move to other areas, but this will result in increased fishing pressure in those areas. It is currently unlikely that new, alternative trawl corridors will be found. In the interests of the fishery, the maintenance of existing trawl corridors is essential to safeguard trawling conditions.

The location of the wind farm must be defined so that there is a buffer zone of at least three kilometres between the outermost turbines and nearby trawl corridors. The buffer zone will allow trawling to continue along existing routes and will not create a conflict between energy production and commercial fishing. Trawlers will be able to pass safely around the power plant area, even in challenging wind and current conditions, and the risk of gear breakage will be minimised.

To establish the buffer zones, trawl corridors should be identified along the entire width of the routes used, using VMS data. VMS data for Finnish fishing vessels can be obtained from the ELY Centre for Southwest Finland.

In addition to the Sylen offshore windfarm, five similar projects have already applied for a permit in the area - Eysterasalt and Fyrskeppet, Sigma, Lambda and Gävle Öst. In addition, two similar projects in the southern part of the Bothnian Sea have also applied for permits. All these projects are so close together that they would form a virtually connected area covering more than one sixth of the area of the Bothnian Sea.

If all these projects are approved, the combined impact on the potential of the Finnish fishing fleet could be very significant, at least if the conflicting interests cannot be resolved.

The requirements of the fisheries authority concerning the application for a permit:

1. The permit application should be rejected until the below mentioned studies and additional measures have been carried out.

- i. Herring spawning areas should be mapped in the project area.



- ii. The eDNA survey should be repeated to investigate the fish population in the project area.
 - iii. Sea current, turbidity and noise impacts must be assessed in relation to the combined effects of the neighbouring projects that have applied for a permit.
 - iv. The full width of the permanent trawl corridors of the last ten years should be identified from the VMS data and marked on the map.
 - v. The location of the windfarm must be delimited so that there is at least a three-kilometre buffer zone between the outermost power plants and nearby trawl corridors.
2. The project must be implemented in such a way that there are no conflicts between wind power and fisheries,
 3. No harm to herring reproduction
 4. Construction work may only be carried out in a limited sector each year, according to the sectoral breakdown in Annex G. Construction in the same sector in consecutive years should not be allowed.
 5. Underwater noise and sediment dispersion must be prevented the best available means. Techniques that decrease underwater noise should be used throughout the construction phase, not just during the sensitivity stages defined for biota.
 6. If permits are issued for this project and others in the same area, the responsible authority should synchronise the timetables and permit conditions for these projects in order to avoid combined and long-term negative impacts on the same areas.
 7. There must be no fishing or traffic prohibitions in the trawl corridors.
 8. The applicant should be required to monitor the fisheries impact of the project.
 9. Any fishing damage and loss of interest caused by the project must be compensated to the parties concerned without delay.

Natural Resources Institute Finland (Luke)

The project area of Sylen is not a significant trawling area for either Swedish or Finnish fishermen, as the assessment report indicates. Consequently, the implementation of the project would not directly impact trawling. Several other wind farms are planned for the southern Bothnian Sea. It is acknowledged that wind farm areas also affect other maritime traffic routes, and their partial redirection to trawling areas can contribute to congestion that hinders fishing. The potential combined effects on trawling should be considered at the scale of the whole marine area and not just in the context of the EIA of individual projects.

It is probable that the bird species and individuals that nest in Finland also migrate through the area. A literature review, three-day boat surveys and one-day aircraft surveys are insufficient to determine the migratory behaviour of birds in the area. Furthermore, the EIA report does not include any observations of potential night migration. In order to obtain more reliable information, on-site observations would also be needed at sufficiently long intervals in spring and autumn, preferably over several years, as migration routes may vary with weather conditions and timing. In recent years, the migration routes of the greylag goose (*Anser anser*) and the bean goose (*Anser fabalis*) have been surveyed using satellite transmitters. The observations indicate that the migration routes of geese in the Bothnian Sea pass through key planning areas for offshore windfarms. The risk of collision should be assessed.

Several wind farms are planned for the Swedish and Finnish maritime waters in the Bothnian Sea. This has the potential to increase the risk of collision for birds migrating through the area.



The potential impact of these wind farms on bird migration patterns, including the possible disruption of migratory routes and an increase in energy consumption due to the avoidance of wind turbines, is a key concern. While the EIA report concludes that the impact on birds is negligible, this conclusion is not fully justified. Natural Resources Institute believes that, in regard to birds, the potential combined effects of several projects should be considered at the scale of the whole marine area, and not just in the context of the EIA of individual projects.

The Government of Åland

It is vital that the development of offshore wind power in the Baltic Sea is planned in a coordinated manner, especially with regard to Swedish, Ålandic and Finnish windfarms in the Bothnian Sea. In accordance with the precautionary principle, the Government of Åland supports the conduct of further studies to assess the potential impacts of wind farms located in close proximity to each other and adjacent to other countries. It is essential to conduct joint studies to investigate all potential cumulative effects. The Government of Åland welcomes such an initiative and is willing to cooperate with Sweden, Finland or another country in the Baltic Sea.

As an example of a cumulative effect, wind wakes can occur behind large windfarms, according to the modelling conducted by Sveriges meteorologiska och hydrologiska institute (SMHI) in 2024. In stable conditions (summer conditions), the wind wakes can extend about 30 kilometres behind a windfarm. This has an impact on both salinity and temperature. The results are due to the fact that wind wakes behind the wind farms lead to reduced vertical mixing of the seawater. This is due to the fact that wind wakes behind windfarms lead to reduced vertical mixing of the seawater. This finding is supported by SMHI's report, Hydrographic effects in Swedish waters of future offshore wind power scenarios (REPORT OCEANOGRAPHY No. 77, 2024).

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

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

The modelling results also show that the wind turbine foundations (modelled bedrock) cause a decrease in salinity in the deep waters of the Baltic Sea, probably due to increased friction and mixing in the Baltic Sea estuary.

The report also includes modelling runs for winter ("whole"), i.e. a period when there may be more wind. These are the runs that demonstrate the most significant impact, though they may also be overestimated. This makes it challenging to accurately assess the true impact. To make informed decisions, more knowledge and cooperation are needed.

Åland Environmental and Health Protection Authority

Distance to Åland and cumulative effects

Åland Environmental and Health Protection Authority (ÅMHM) notes that the distance to Åland in the environmental impact assessment for the project is stated to be approximately 110-132 kilometres. However, in chapter 6.13.4, the distance to "Åland and its archipelago" is stated to be 180 kilometres. According to the letters from the Government of Åland, the distance to Åland waters is approximately 75 kilometres and the distance to the coast 90 kilometres. At these distances, there may be a risk of visual and environmental impact.



Preparations are currently underway for an auction procedure for establishing offshore wind power in Åland's northern sea area, an area that has been identified in the "Maritime Plan for Åland" as the most suitable place for wind power.

Need for coordination

Several projects are in the planning stage in the Bothnian Sea. ÅMHM considers that the lack of coordination between these projects is problematic, among other things, due to the risk of cumulative effects and an impact on the possibilities of implementing other projects. To ensure the optimal implementation of offshore wind power in the Bothnian Sea, coordinated transboundary planning is recommended.

The Regional Council of Satakunta

The Regional Council of Satakunta emphasises the importance of the Maritime Spatial Plan for Finland 2030, which was approved at the end of 2020, in the EIA process. The Finnish Marine Spatial Plan 2030 does not propose offshore wind energy production areas as regional reserves but identifies potential areas for offshore wind energy development. While the Finnish Marine Spatial Plan 2030 is not legally binding, its effectiveness is largely dependent on the extensive stakeholder cooperation and coordination of the objectives of different sectors. The Finnish Marine Spatial Plan 2030 is currently being updated, with the aim that the Regional Councils of Finland's coastline will prepare a new Marine Spatial Plan by the end of 2026. The update is driven by the many changes in the marine environment since the first plan was drawn up and by the many national and EU-level agreements and targets that pose new challenges to the sectors and the planning process. These include the 30% marine protected area target set by the Biodiversity Strategy, the growth targets for the fishing industry under the promotion programme for domestic fish, the development of offshore wind energy, overall security issues and the changing needs of maritime traffic.

The planning of offshore wind power in the Gulf of Bothnia and the Bothnian Sea has increased significantly in recent years. In the update of the Swedish Marine Spatial Plan (<https://www.havochvatten.se/planering-forvaltning-och-samverkan/havsplanering/granskning-av-forslag-till-andrade-havsplaner/forslag-till-andrade-havsplaner.html>) several new, large offshore windfarms are planned for the Bothnian Sea. As offshore wind power has an impact on other uses of the sea and important economic activities in the Bothnian Sea, such as shipping and fishing, as well as on the environment and nature ecosystems, the need for coordination when planning of different projects is apparent throughout the Gulf of Bothnia. Energy transmission related to offshore wind power also impacts the environment, ecosystems, and land use of mainland areas. To support a controlled development vision and assess overall impacts, cooperation between states must be further intensified.

Although the distance of the planning area is approximately 140 kilometres from the Finnish coast, the Regional Council of Satakunta believes that the possible impacts on the Finnish maritime area should be taken into account in the EIA process for the offshore windfarm Sylen. The EIA has therefore addressed transboundary impacts and the combined effects of the Sylen project with other known projects. The EIA states that in the case of transboundary impacts, only a minor impact on seals, fish and commercial fisheries has been identified. According to the report, the Sylen offshore wind project is not expected to cause significant transboundary impacts.

The Regional Council of Satakunta emphasises the significance of an open, interactive and sufficiently broad assessment process for large-scale offshore wind projects. Impact assessment is a fundamental aspect of planning projects in the Bothnian Sea. Impacts that extend beyond the immediate project area must be thoroughly examined and given full consideration during the planning stage, including effects on birds, fisheries and commercial



fishing. The Gulf of Bothnia is an important migration route for birds and the state of fish stocks has a direct impact on the entire Bothnian Sea and the Gulf of Bothnia. In addition, the impact assessment should pay particular attention to shipping and take into account the varying ice conditions in the Bothnian Sea.

Finnish Transport and Communications Agency Traficom

The planned offshore windfarm Sylen and several other planned offshore windfarms are located in or in the immediate vicinity of the most important maritime traffic areas in the Bothnian Sea.

The construction of the offshore windfarm Sylen, in conjunction with other planned offshore windfarm projects in the central Bothnian Sea, would result in a concentration of shipping in the Bothnian Sea into narrower areas, thereby increasing the risks of ship collisions and oil spills, among other potential consequences. These risk factors could also have transboundary impacts.

In the EIA report of the project, the impact of the offshore wind farm on shipping is presented as relatively small. However, Traficom considers that it would have been justified to extend the analysis of impacts on shipping, to all offshore wind projects in the central Bothnian Sea, including the projects planned for the Finnish Exclusive Economic Zone in order to obtain a more realistic overall picture. This would provide a more holistic and realistic overview of the potential impacts. Achieving coordinated, sustainable forms of land use across the entire Bothnian Sea would require more comprehensive cross-border coordination between authorities, as the impacts of offshore wind power projects extend far beyond individual project areas. The current permitting and assessment processes for offshore windfarm projects focus mainly on the estimated impacts of individual projects, making it challenging to achieve controlled coordination between different areas and to assess the overall impacts.

As the project progresses, it is vital to identify and investigate the potential impacts of offshore windfarms on maritime radar and radio equipment/systems, as well as satellite navigation systems. During the construction phase of the windfarm, field tests should be conducted to accurately determine these impacts. This will allow for the implementation of mitigation measures for radar and radio equipment/systems, as well as satellite navigation systems, that are crucial for maritime navigation as soon as possible. It is essential to investigate the impacts not only for vessels operating in traffic areas, but also in exceptional situations where vessels have drifted close to or into the offshore wind power area.

Traficom welcomes the project developer's commitment to mapping and assessing the impacts of the offshore wind farm on radio communications and maritime radar operations, and to implementing measures to reduce disturbances.

Finnish Transport Infrastructure Agency

The area of the planned project is located in close proximity to the most significant shipping routes in the Bothnian Sea. The area experiences high levels of traffic between the Åland Islands and the Swedish port of Sundsvall, and to the east is the primary route for maritime traffic in the Bothnian Sea between the Åland Islands and the Kvarken.

In the vicinity of the project area, there are also many other offshore wind farms planned in both the Swedish and Finnish exclusive economic zones. If implemented, offshore wind farms would concentrate maritime traffic in a narrower area, increasing the likelihood of collisions and resulting oil spills also in the vicinity of the Finnish EEZ. Furthermore, the operation of these windfarms may disrupt icebreaking operations in Finnish waters.



The EIA report should have examined the project's effects on maritime traffic as part of the combined impact on several areas. To accurately assess the impact of offshore wind energy on navigational conditions, both in open water and during ice-free periods, the Finnish and Swedish authorities must collaborate to evaluate the combined effects of the various project areas.

The Finnish Transport Infrastructure Agency agrees with Traficom's views in their statement TRAFICOM/609575/04.04.05.01/2023 regarding maritime radar and radio equipment and systems as well as satellite navigation systems used in maritime traffic.

Finnish Meteorological Institute

With the regard to the marine survey, the Finnish Meteorological Institute considers the EIA report to be comprehensive.

As the construction of the windfarm may affect measurements for monitoring the state of the Baltic Sea (e.g. with free-drifting profiling floats), and as there is little information on the conditions of the open sea in the Baltic Sea in general, the Finnish Meteorological Institute considers it important to establish the measurement station mentioned in section 4.5.1 in the area of the wind farm.

The Finnish Meteorological Institute has no comments on the weather radar network, as the area is more than 20 kilometres from the nearest weather radar.

Finnish Association of Professional Fishermen (SAKL)

The Finnish Fishermen's Association is highly critical of offshore windfarms. The development of offshore wind power in areas where fish reproduce or spend a significant portion of their life cycle has the potential to impact commercial fishing opportunities. This is particularly relevant for pelagic fisheries, where the coexistence of wind energy and fishing in the same area is currently impossible. As a result, windfarm areas compete with the fishing industry.

In the context of offshore wind energy development, significant areas of water are transferred to private interests and for exclusive use, effectively excluding other potential uses.

There is a pressing need for further research to be conducted on the impact of windfarms on the marine environment, particularly on fish species. Prior to the development of wind energy, it is essential to gather knowledge based on long-term studies (at least 10 years) at existing windfarms. Failure to do so may result in projects causing irreversible damage. It is also vital that wind energy sites for which new permits are granted are subject to strict requirements for multi-year data collection to gather additional knowledge.

Right to fish

Firstly, it should be noted that Finland, and thus fishing vessels under the Finnish flag, have, under EU law, the right to access and fish up to four nautical miles from the Swedish baseline in the Baltic Sea. The proposed construction in the project area of Sylen therefore interferes with the right of fishermen to utilise the area and carry out economic activities.

This right was introduced into EU law when Sweden and Finland joined the Union and has since been renewed. It is based on historical fishing in each other's zones.

Impact on commercial fishing



SAKL notes that Finnish trawling for Baltic herring (*Clupea harengus membras*) and sprat (*Sprattus sprattus*) is extensive in terms of volume in the Bothnian Sea, partly in the planned industrial area and especially in its immediate vicinity (the fishing grounds around Sylen).

The impact on fishing in and around the project area, including Finnish fishing, is assessed in the EIA report. The material is inadequate to the extent that exact fishing patterns and trawl hauls (trawl tracks) are not apparent in the material. This may also result in an underestimation of the value of commercial fishing in the area or its vicinity, as it may be related to trawl hauls that partly extend beyond the area. It is crucial to acknowledge that fishing patterns have evolved over an extended period, shaped by the natural environment and the cumulative expertise of fishermen.

In the southern and eastern outer edge of the planned windfarm area, important pelagic fishing is conducted by Swedish and Finnish fishing vessels. The planned windfarm area disrupts trawling patterns, thereby affecting fishing activities in a larger area that extends beyond the designated area. The impact on commercial fishing is not adequately addressed in the application, as the method used to illustrate commercial fishing is not appropriate.

These are significant deficiencies, and without this information, it is not possible to fully assess the impact on fishing by Swedish and Finnish fishing vessels in and around the planned area. The analysis of commercial fishing should be redone and supplemented with the actual trawls to illustrate the geographical utilisation of the park area by fishing. The current analysis is not a sufficient basis for the permit decision.

Pelagic trawling is a space-consuming activity that cannot currently coexist with marine wind turbines. The fishing gear, including cables and trawls, can extend over a kilometre in length and weigh hundreds of tons when full of fish. In poor weather conditions, it is not possible for the fishing vessel to avoid or stop by a wind turbine. In practice, a windfarm area is a completely closed area where fishing cannot take place. Pelagic fishing is an inherently dynamic activity, following the annual migrations of fish.

Impact on fish communities

Additionally, there are aspects of the description of the fish community and its potential impact from the planned windfarm area that require attention. The company has conducted only a desk study and has not carried out field surveys or test fishing. Even though the species composition in the Bothnian Sea is relatively similar, this is a significant limitation in the data. Furthermore, the company has carried out an e-DNA survey once, which seems to have been unsuccessful as it did not yield any fish DNA at all.

There is a significant lack of knowledge regarding the impact of windfarms on both the environment at large and on different fish species. Changes in currents and mixing, chronic low-frequency underwater noise and vibration, and electromagnetic fields around submerged cables can all affect fish, including during migration. Given the unique biology of each species, it is essential to consider how different fish species may react differently. These are areas where much knowledge is still lacking. Consequently, it is imperative that these factors and their potential impact on marine fauna at all levels, both locally and regionally, are thoroughly investigated. This type of knowledge should be a mandatory requirement for any permit issued.

Cumulative effects

The assessment of the cumulative impact of several offshore wind industrial sites is insufficient to date and should be carried out before any permits are granted in the Gulf of Bothnia. It is



widely acknowledged that a significant competition is underway, with numerous companies reserving and planning areas for offshore wind energy. However, the potential impacts of the offshore wind industry on the Baltic Sea environment and fauna, as well as other activities, have not been thoroughly explored through independent research. For instance, the Natural Resources Institute Finland is only now planning to start such research, possibly during next year.

While Sylen itself may have transboundary effects, the cumulative effects of different planned areas will also lead to additional transboundary effects and intensify them.

Position, claims

The main claim of SAKL:

The area of the planned Sylen windfarm site should be adjusted (reduced) from the south and east to minimise negative impacts on Swedish and Finnish commercial fisheries.

The secondary claims of SAKL should be given appropriate consideration in the conditions:

1. Trawling in the area and its vicinity must be permitted with minimal restrictions and damage;
2. Piling works and works causing turbidity in the area should be scheduled during a period in which fish spawning is not likely to be disturbed;
3. The project should fully compensate fishing companies in Sweden and Finland for any damage and losses incurred during the construction phase and operational period;
4. Part of the revenue from energy production in the area should be allocated to a fund to compensate for long-term damage to fisheries, ensuring the industry's survival in a changing operating environment and financing measures to restore the marine environment;
5. A long-term monitoring programme should be established to collect data on fish and other marine animals, the results of the programme should be available to authorities and scientists for objective evaluation. The results of the programme should be made available to authorities and scientists for objective evaluation;
6. Upon decommissioning, the environment should be completely restored to its original state;
7. Even if cabling is decided at a later stage, it should be installed in such a way that it does not impede trawling or coastal fishing; and
8. The permit should not be granted until all cabling has been planned and constructed in such a way as to fulfil point 7 above.

Centre for Economic Development, Transport and the Environment of Lapland, The Finnish Border Guard, Finnish Safety and Chemicals Agency (Tukes) and Regional Council of Southwest Finland did not have any comment on the matter.

Conclusions

The statements received during the consultation focused mainly on biological effects, fish stocks and fisheries, and impacts on wind, current, and thermal conditions. They also addressed maritime traffic and the combined effects of different offshore windfarm projects. The EIA lacks modelling of the project's impact on wind and sea current conditions. These impacts should be assessed from Finland's perspective.



The heat emissions and their impacts have not been presented in the EIA report. The impact assessment of these emissions should be added to the report. In addition, the impact assessment of magnetic fields is not detailed enough and should therefore be clarified. The project's risk of introducing invasive alien species has not been identified. The risk of invasive alien species needs to be assessed, and the necessary mitigation measures to minimise the risk of invasive alien species should be presented. Migratory fish routes should be studied to assess the impact of the project on migratory fish.

In addition, certain impacts have not been adequately assessed. The biological surveys are incomplete. For example, blue mussels (*Mytilus spp.*) have not been detected, indicating that the biological surveys are incomplete. Fish stock surveys in the area are also inadequate and herring (*Clupea harengus membras*) spawning areas have not been identified. Both fish species and herring spawning grounds should be studied in more detail using appropriate methods.

The report underestimates the impact on fishing, particularly trawling, which occurs in the immediate vicinity of the project. The negative impact of the project on Finnish trawling should be assessed in more detail.

The assessment of the combined and cumulative effects of different windfarm projects has been conducted, but it needs to be supplemented. The combined effects of the projects on wind conditions and sea currents, as well as on fishing and maritime traffic, should be assessed. The Swedish projects have been included in the analysis of the combined and cumulative effects of the projects. The Finnish Environment Institute points out that offshore windfarm projects in the Bothnian Sea are planned in Åland and Finland as well.

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

Head of Services

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Wilma Poutanen

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

