Suomen ympäristökeskus
Finlands miljöcentral
Finnish Environment Institute

Authority services 29 February 2024 SYKE/2024/77

Swedish Environmental Protection Agency
registrator@naturvardsverket.se

Reference: NV-00825-23

Finland's response to the notification regarding the planned offshore energy farm project “Pleione”

The Finnish Environment Institute hereby acknowledges that Finland has received the notification, dated 10 January 2024, and the consultation documents from Sweden in accordance with Article 3(1) of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) regarding an environmental impact assessment (EIA) procedure of the planned offshore energy farm project "Pleione" in Sweden's exclusive economic zone (EEZ), located about 37 kilometers east of Gotland and covers an area about 194 km2. OX2 AB (publ) intends to apply for a permit to construct and operate the project. The Pleione Energy Farm will consist of approximately 42–70 wind turbines and hydrogen plant(s) on specific platforms or on the bases of the wind turbines. The project will include related equipment as transformer/inverter stations and submarine cables. The maximum overall height of the wind turbines is expected to be up to 370 meters. The Pleione Energy Farm is expected to generate about 5 TWh of electricity per year and it is expected to be operational by 2030.

Consultation in Finland

According to the Act on Environmental Impact Assessment Procedure (252/2017), the Finnish Environment Institute is the competent authority and responsible for consultation tasks related to the Espoo Convention. The Swedish Environmental Protection Agency requested an indication whether Finland intends to participate in the EIA procedure and to provide comments on the scope of for the assessment of the environmental impacts of the project on Finland, and to submit any comments that might be received from the public in Finland. The public and authorities were given the opportunity to comment on the consultation documents from 23 January to 22 February 2024. The consultation documents were available, and statements were asked on the website of Finland's environmental administration and on the website of electronic public consultation. The Finnish Environment Institute received 12 statements.

Suomen ympäristökeskus
Finlands miljöcentral
Finnish Environment Institute

Participation in the EIA procedure and remarks during the consultation

Based on the received statements and deliberating 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 EIA procedure.

Finland wishes to note that planning of offshore wind farms has increased in the Baltic Sea region which has raised concerns, among other things, about the need for an overall assessment. In this case, there is additional offshore hydrogen plant(s) planned on specific platforms or on the bases of the wind turbines. In addition, the project will include related equipment as transformer/inverter stations and submarine cables. In this kind project all contributing factors should be known, and their impacts assessed to ensure that the decision on the implementation of the project is based on firm knowledge of its impacts and on the best possible solution. In addition, as cumulative impacts of several offshore energy farms can potentially be ecologically significant, it is important to examine and assess cumulative impacts as widely as possible. In addition, the EIA documentation should clearly address transboundary impacts from Finland's perspective and consider the remarks in the statements in further planning. The original statements, which are enclosed to this letter, include important and detailed remarks which need be taken fully into account in the EIA. The Finnish Environment Institute has prepared a summary of the original statements.

Statements received

Finnish Transport and Communications Agency (Traficom)
Finnish Transport and Communications Agency states as follows: The planned offshore wind power projects in the Baltic Sea have grown significantly in recent years in both Finland and Sweden. If implemented, a large-scale offshore wind farms, and especially offshore wind farms located near each other, it can have a significant impact on shipping in the Baltic Sea from the perspective of both maritime safety and its smoothness.

When delimiting the area of planned offshore wind power projects, it is important to consider the traffic routes used by shipping also outside the reinforced fairways and routing systems, so that the operating conditions and safety of shipping are considered in the planned project area. The potential combined effects of offshore wind power projects surrounding the project area on shipping in the area should be comprehensively investigated during further planning. Large wind farms located close to each other can centralise and change shipping routes compared to the current ones (to be considered when assessing impacts).

In the spatial planning of areas designated for wind turbines and the placement of individual wind turbine structures, consideration should be given to radar usage as the primary navigation and collision avoidance tool for vessels, and its central role in the traffic control. Wind turbines can cause either shading or spillover effects on marine radars, which at worst make it difficult to interpret radar signals. Wind turbines can also affect the satellite positioning of vessels, i.e. the Global Navigation Satellite System (GNSS), in such a way that satellite signals are reflected through wind turbines, causing incorrect positioning of the vessel using the system.
The location planning of the area designated for wind turbines, and later for individual wind turbines, consideration should also be given to the potential impacts of wind turbines on maritime and coastal radio systems. The reliable operation of radar and radio systems is an essential part of maintaining maritime and public safety. Effects of wind turbines on radars,

radio navigation equipment, etc. The operation of radio equipment important for shipping and traffic control should be taken into account and ensured.

The operation of radio links operating in the sea area requires a fully accessible area between transmitter and receiver. Since electronic communications services in coastal and maritime areas depend on radio systems, it is important to ensure that mobile services, radars and radio links operate sufficiently undisturbed, including in maritime areas. Even small changes in the placement of wind turbines can have a decisive impact on the operation of radio systems in an area. Traficom considers it important that these factors are also considered.

In Traficom's view, it would be justified for Finland to participate in the EIA procedure of the planned project, because considering the location of the project area and other offshore wind power projects planned in the vicinity of the project area, the projects may also have an impact on shipping to and from Finland.

Ministry of Transport and Communications
The Ministry of Transport and Communications has no comments to make on the notification or consultation document, but it would be justified to be able to follow the process also in the future. From Finland's point of view, it would be useful to obtain more information on, for example, the studies and practices used to support planning, especially when coordinating shipping and offshore wind power.

Metsähallitus
The Pleione offshore wind farm may cause significant adverse cross-border environmental impacts on, for example, birds and biodiversity, which is why Metsähallitus considers that Finland needs to participate in the EIA procedure for the project.

Millions of birds migrate past Gotland in spring and autumn, some of them nesting in Finland and nearby areas, and some migrate further afield through Finland, for example to the Arctic regions. Thus, the planned wind power area may also have bird population impacts in Finland. Metsähallitus considers it necessary that the project carry out the required studies on the effects of the offshore wind farm on migratory seabirds. The significance of the area as a feeding and resting area for birds should also be investigated through seasonal field studies, as the information presented in the programme is based on very scarce material.

The Pleione offshore wind farm will be located east of the island of Gotland in an area identified in Sweden's amended maritime spatial plans as an alternative clearing area for energy recovery. Areas (Ö212, Ö215) have been identified both north and southeast of the area where special attention has been paid to high natural values, such as fish spawning grounds, bird areas and mussel climate sanctuary. In addition, the organisation Oceana, whose studies have served as a basis for the studies, has proposed the entire project area as a marine nature reserve due to the high nature values of its bottom. Metsähallitus considers that the impacts of the offshore wind farm on both birds and mussels have been well considered in the environmental impact assessment presented, but, for example, the importance of the project area as a spawning ground for fish should be investigated in more detail, especially regarding bottom-dwelling fish.

In the environmental impact assessment programme now presented, the project's effects on hydrography are estimated to be minor, and reference is made to older studies published more

than 15 years ago. However, recent studies show that offshore wind power areas can have major impacts on currents and the hydrography of the surrounding area, causing changes in water stratification and mixing, among other things. These changes may have implications for phytoplankton communities and, more broadly, pelagial production. Metsähallitus points out that the potential wide-ranging hydrodynamic impacts of a wind power field should be assessed more comprehensively in the assessment report, based on more recent and available information.

Mussels are key species in the Baltic Sea, and mussel communities are key habitats. Mussel colonies found in hard and mixed bottoms provide shelter and food for many other invertebrates and fish. Among birds, eiders and allies eat mussels. Metsähallitus points out that the Pleione offshore wind farm may have significant impacts on mussel populations in the project area, which may affect the seabirds that feed on them.

The environmental impact assessment states that the individual density of mussels in the project area would be relatively low but does not comment on the size of mussels. Metsähallitus points out that mussels found in rare quantities may be large and thus constitute a significant source of food for both birds and fish.

Finnish Meteorological Institute
The Finnish Meteorological Institute has studied the proposal and states the following: Regarding marine physics, the Finnish Meteorological Institute points out that it carries out observation activities related to the monitoring of the Baltic Sea using both automatic measurement methods (such as Argo buoys) and measurements made from ships. The construction of the wind farm makes it particularly difficult to use automatic measurement methods in the area, as their maneuverability is limited (e.g. free-floating Argo buoys). Although Pleione energy park is built in a low-lying area where Argo buoys do not normally operate, their route cannot be guaranteed. Due to the impacts related to marine observation, the Finnish Meteorological Institute considers that Finland should be involved in the environmental impact assessment to ensure good availability of marine observations also during the construction of the park – for example, by adding an observation station in connection with the park.

Regarding the weather radar network, the Finnish Meteorological Institute has no comments on Finland's need to participate in the environmental impact assessment procedure for the Pleione offshore wind farm planned for Sweden's exclusive economic zone, as the area is more than 20 km away from the nearest weather radar of the institute.

Finnish-Swedish Transboundary River Commission
The Finnish-Swedish Transboundary River Commission points out that although the project area is located outside the geographical scope of application of the Finnish-Swedish Transboundary River Agreement (91/2010), the project may have impacts on the Torne River through the impact on migratory fish. Salmon in the Torne River will migrate even to the southern Baltic Sea, probably through the project area or over submarine cables that lead the generated electricity to land. For the purpose of the Transboundary Rivers Convention, particular attention must be paid to the conservation and sustainable use of fish stocks (Art. 2.2.d). The Commission underlines that the Commission is interested in this area, as marine activities such as large-scale offshore wind energy may have a potential impact on migratory fish stocks.

Suomen ympäristökeskus | Finlands miljöcentral | Finnish Environment Institute
Latokartanonkaari 11 | 00790 Helsinki | FINLAND
+358 295 251 000 | mailto: kirjaamo@syke.fi | Y-tunnus 0996189-51 syke.fi

The Finnish-Swedish Transboundary River Commission considers Finland's participation in the consultation on the offshore wind power project Pleione important. The Commission stresses that transboundary effects cannot be excluded, especially regarding migratory fish stocks. At the time of writing, there is still limited information on the potential impact of marine wind power on migratory fish stocks. In view of the large amount of planned offshore wind power in the Baltic Sea and the Gulf of Bothnia, the Commission stresses the importance of acting according to the precautionary principle. It is important to thoroughly investigate the potential combined and cumulative impacts on migratory fish stocks from all planned wind power projects in the entire Baltic Sea region.

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

The Centre for Economic Development, Transport and the Environment of Southwest Finland supports Finland's participation in the environmental impact assessment procedure of the planned project.

The greatest combined effects will affect birds, fish, and marine mammals. The Central Baltic Sea region is an important wintering, nesting, and feeding area for many species of seabirds, and large numbers of seabirds migrate through the region. Bird species nesting in Finland can also make use of Swedish sea areas during migration periods, and essential migration routes may be located in the vicinity of the project area. The project may have an impact especially on migratory birds in Finland. Possible synergies with other offshore wind projects planned in the Baltic Sea region are also considered important.

The Centre for Economic Development, Transport and the Environment of Southwest Finland has studied the consultation document corresponding to the project's environmental impact assessment programme. The Centre for Economic Development, Transport, and the Environment of Southwest Finland states that the consultation document should assess the environmental impacts in relation to the indicators of good environmental status of the marine environment and take into account the marine spatial management plan and its objectives. In addition, the effects of cable corridors and marine dumping areas on the integrity of the seabed and extensive habitats should be considered. Noise modelling should also be used to determine the impact of a wind farm during operation on underwater noise in the sea area compared to its current level.

Regarding bird populations, the Centre for Economic Development, Transport, and the Environment of Southwest Finland states that the combined effects of wind power projects located on important main bird migration routes may have population-level effects that weaken bird populations, especially due to collision mortality. In assessing the impacts on bird populations, special attention should be paid to the location of migration routes in relation to wind turbines and the significance of these impacts should be assessed. It is also important to identify rest and feeding areas during migration and the species most sensitive to wind power. Surveys must be carried out appropriately, using the best possible methods. Available satellite monitoring data can be used as an add-on to the impact assessment. Mitigation measures and opportunities to offset impacts should also be examined.

In addition to the regional impacts of wind turbines, synergies must be considered on a large scale and challenges and uncertainties related to direct assessment must be identified.

Suomen ympäristökeskus | Finlands miljöcentral | Finnish Environment Institute
Latokartanonkaari 11 | 00790 Helsinki | FINLAND
+358 295 251 000 | mailto: kirjaamo@syke.fi | Y-tunnus 0996189-51 syke.fi

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

In the view of the Fisheries Authority, Finland should participate in the EIA procedure of the Pleione project in the future. Finland has fishing rights in the project area, Sweden's exclusive economic zone, and there are fishing activities by Finnish vessels in the neighbouring areas. In addition, fish stocks in the Baltic Sea are shared, and fishing is regulated at EU level.

The Authority notes that, in accordance with Article 5(1) of Regulation EU 1380/2013 of the European Parliament and of the Council, Finnish fishing vessels have the right to fish in the Swedish exclusive economic zone where the planned offshore wind power production area is located. Fishing by Finnish vessels or vessels landing in Finland in the project area and its neighbouring areas is currently sporadic. Despite this, the Fisheries Authority considers the potential of the project and neighbouring areas to be significant for Finland's security of supply and the development of fisheries. Fish stocks important for Finnish fisheries, especially herring, sprat, cod and salmon, circulate in the project area.

Construction activities and continuous operations may affect fishing, fishing opportunities, the value and availability of catches, fish migration routes, reproductive success, and contaminant concentrations, and thus Finnish fisheries. In addition, the Authority considers that the ecological impact of such a large project on the ecosystem of the jointly exploited marine area and thus on the common fish stocks could be significant. The Pleione project is one of several projects that may be implemented simultaneously in the Baltic Sea. The impacts of significant projects alone can multiply and permanently change the marine environment. For this reason, all impacts must also be assessed from the point of view of synergistic effects.

Regarding the environmental issues, most issues are considered, and planned studies are appropriate. However, a more detailed description of studies is almost always missing or insufficient. The fish population and the direct impacts of the activities on fish populations are adequately described. The consultation document claims that there is little fishing in the production area, but the data presented are insufficient to support this claim. The fishing activities of Finnish vessels in the vicinity have not been studied. The impact of submarine export cables on fisheries is not analysed at all. The document recognises that the project will cease trawl fishing in the production area altogether, but there is no analysis of the wider impact. There is also a complete lack of more detailed research into fisheries, which means that the effects cannot be assessed. The document does not relate the project area and cable corridors to the areas reserved for commercial fishing (riksintresse yrkesfiske) in the Swedish maritime spatial plan. According to the maritime spatial plan, fishing vessels should be able to fish in these areas (Förutsättningar för att bedriva yrkesfiske ska bibehållas. God tillgänglighet för yrkesfiskefartyg till hamnar och fiskeområden lämpliga utifrån variationer över säsonger och år ska beaktas.). The document does not mention potential oil or gas deposits in the area or address their risk potential.

The Authority considers that the following issues need to be thoroughly clarified:

- Current state of fishing and permanent changes in fishing opportunities: Wind farms and their remnants prevent trawling, as also stated in the consultation document. Submarine export cables also hinder or prevent trawl fishing. The current fishing use of the production and neighbouring area and the export cable corridors for all EU countries active in the area and how the project will affect fishing opportunities, must be clarified. Potential fixed trawl routes and lifting points shall be identified (through VMS data and interviews). Areas where

Suomen ympäristökeskus | Finlands miljöcentral | Finnish Environment Institute
Latokartanonkaari 11 | 00790 Helsinki | FINLAND
+358 295 251 000 | mailto: kirjaamo@syke.fi | Y-tunnus 0996189-51 syke.fi

trawling becomes impossible must be marked on the map. Where appropriate, how fishing can be enabled (e.g. trawling corridors, changes to project area boundaries) shall be provided. Long-term consequences after a possible decommissioning or disaster must also be taken into account. The dismantling capacity of power plants and other structures shall be assessed. In the view of the Fisheries Authority, the technical conditions for safe trawling do not exist when the distance between power stations is less than 3 km. The Fisheries Authority is aware that, as things stand, fishing by Finnish vessels in the area is very low. However, the area has potential significance for Finnish vessels, and considering the interests of the vessels currently operating in the area also secures fishing opportunities for the Finnish Navy.

- Impact of sediment emissions during construction on fish stocks: Dredging, cabling and disposal operations cause extensive turbidity and sediment emissions. The scale of the project refers to an emissions period of several years within a radius of at least tens of kilometres. Modelling of the passage of sediment clouds caused by construction work shall be carried out and the impact on the chemical-physical conditions of the water (e.g., O2 and nutrients) shall be assessed, both in terms of construction activities and the resulting changes in the bottom profile. Timing options for expected sediment discharges shall also be presented so that disruptions can be related to other future projects. On this basis, an assessment shall be made of the harmfulness of this to the spawning grounds, benthic fauna and the oxygen status of the underwater in the affected area. Where appropriate, proposals shall be made on how to avoid overloading sensitive areas (e.g., technical solutions, construction strategies such as construction breaks).
- Changes in flow conditions and stratification: the wind turbine area is so large that effects on surface flows are possible (wind weakening, upwelling and subsidence, temperature and salinity differences created by hydrogen production). These can affect water stratification, temperature and concentrations of nutrients, salt and oxygen at different depths. In theory, stronger stratification could alter nutrient concentrations in surface water, causing changes in fishing production and blue-green algae blooms. Expected changes in flow and stratification conditions and their impact on physicochemical conditions shall be modelled and the impact on ecosystems and fisheries shall be assessed.
- Toxic emissions (substances/compounds, estimated amounts, time intervals) and potential for accumulation in fish: At least the following shall be considered as potential sources: sediments, drilling chemicals, protective paints, lubricants for turbines and moving parts, transformer coolants. There are also accidents and e.g. The potential emissions scenarios of sabotage (worst-case) must be assessed in terms of their impact on fisheries.
- Organic hydrocarbons: Oil drilling has been planned in the area in the past and oil or gas is likely to be there. Natural hydrocarbon leakage from the seabed has been observed on Gotland. It must be assessed whether the construction works can release petroleum or gas from the seabed.
- Research-based assessment of how wind farm structures and possible artificial reefs affect ecosystem structure and fish stocks (reef effect): The positive reef effect mentioned in the document is a theory that needs to be proven in the conditions of the project site. The reef effect is a change in natural ecosystems that must be approached primarily on the precautionary principle.
- Potential and impact of oxidation technology: The document proposes that surplus oxygen from hydrogen production be discharged into the depths to improve oxygen conditions. These claims should be supported by technical analysis and modelling to explain the expected quantitative and qualitative impacts, potential risks and challenges, and implementation opportunities.

Suomen ympäristökeskus | Finlands miljöcentral | Finnish Environment Institute
Latokartanonkaari 11 | 00790 Helsinki | FINLAND
+358 295 251 000 | mailto: kirjaamo@syke.fi | Y-tunnus 0996189-51 syke.fi

- Alien species strategy: The Baltic Sea is vulnerable to alien species that can also adversely affect fish stocks. If other wind power projects are implemented, the import of construction and dredging vessels and foundations from outside the Baltic Sea seems likely. Such equipment may be a more suitable platform for the establishment, survival, and domestication of various organisms than ordinary merchant vessels. The project manager must understand the risk of invasive alien species and a strategy on how to respond to it. The steppingstone effect of the park's artificial structures must also be considered, for example. when choosing different building materials. The thermal and reef effects (local eutrophication) shall also be assessed in this context. In particular, the heat emissions from hydrogen production must be assessed from the perspective of the introduction of alien species and strategies must be put forward to avoid this.

Finnish Association of Professional Fishermen (SAKL)
Finnish Association of Professional Fishermen states that, a large number of offshore wind industry areas are currently planned for the Bothnian Sea, the Bay of Bothnia and the northern parts of the main basin of the Baltic Sea without greater coordination and analysis of synergies. In practice, the project areas will become fishing prohibition zones.

The above-mentioned sea areas are important for the Finnish fishing industry. In November 2023, Luke published a report entitled "Fishing areas of the Finnish trawl fleet in the Baltic Sea in 2010–2022. The impact of a possible Pleione offshore wind farm area on fish and fishing (especially Baltic herring, sprat, salmon) and Finnish fisheries must be thoroughly investigated. The long-term significance of the project area for commercial fishing shall be assessed. It is particularly important that the cumulative effects of the project with other planned areas are investigated. SAKL agrees with the views of the Southwest Finland Fisheries Authority on the project.

With reference to the above, SAKL considers it essential that Finland participates in the EIA procedure for the Pleione project planned in Sweden and monitors its progress.

The Government of Åland
The Government of Åland has decided to issue the following statement: There is no need for the Åland Islands to participate in the environmental impact assessment procedure for the Pleione Energy Park offshore wind farm east of Gotland in the Swedish exclusive economic zone. The distance is so large, just over 200 kilometres to Åland waters and just over 250 kilometres to the coast of Åland, that direct consequences for Åland are considered unlikely.

Finnish Heritage Agency
Finland's need to participate in the environmental impact assessment procedure for the planned Pleione offshore wind farm in Sweden's exclusive economic zone.

The Finnish Environment Institute has given the Finnish Heritage Agency the opportunity to comment on Finland's need to participate in the environmental impact assessment procedure for the planned Pleione offshore wind farm in Sweden's exclusive economic zone. The Finnish Heritage Agency comments on the matter from the perspective of underwater cultural heritage.

The Finnish Environment Institute has received notification from the Swedish Environment Agency concerning the initiation of an environmental impact assessment procedure in accordance with the UN/ECE Convention on Environmental Impact Assessment in a

Suomen ympäristökeskus
Finlands miljöcentral
Finnish Environment Institute

Transboundary Context (Treaty Series 67/1997, Espoo Convention) in connection with the Pleione Energipark AB offshore wind farm project. An offshore wind farm with a total output of approximately five terawatt hours (TWh) is planned in Sweden's exclusive economic zone. The project is located approximately 37 kilometres east of the island of Gotland. The project area covers approximately 194 square kilometres and consists of approximately 42–70 offshore wind turbines and hydrogen power plants.

According to the experience of the Finnish Heritage Agency, underwater cultural heritage sites related to a construction project on the high seas are, above all, shipwrecks that may have historical connections to different states. International exchange of information related to wrecks and their protection and research is common practice, which is a prerequisite for understanding the background of the sites and for their benefit in terms of conservation. However, underwater cultural heritage sites are physical remains located in a limited area for which mapping, conservation and research activities do not have concrete cross-border environmental impacts.

From the perspective of taking underwater cultural heritage into account, Finland has no need to participate in the environmental impact assessment procedure for the Pleione offshore wind farm project planned for Sweden's exclusive economic zone.

The Finnish Border Guard
The Finnish Border Guard has no comment on the matter.

The Finnish Transport Infrastructure Agency
Wishes to thank for the opportunity to comment, but no specific comments to make on the matter.

Service Development Director — Heli Karjalainen

Senior Officer,
Point of Contact to the Espoo Convention
and the Protocol on SEA — Ulla Helminen

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

Suomen ympäristökeskus
Finlands miljöcentral
Finnish Environment Institute

Appendices Received statements in Finland

For information
Ministry for the Foreign Affairs of Finland
Ministry of the Environment
Ministry of Transport and Communications
Finnish Transport and Communications Agency (Traficom)
Finnish Meteorological Institute
Metsähallitus
Finnish Transport Infrastructure Agency
Government of Aland
Finnish Association of Professional Fishermen (SAKL)
Finnish – Swedish Transboundary River Commission
The Finnish Border Guard
The Finnish Heritage Agency
Centre for Economic Development, Transport of Southwest of Finland
Centre for Economic Development, Transport of Southwest of Finland - Fisheries Authority