

Authority Services

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Swedish Environmental Protection Agency
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Finland's response to the notification in accordance with Article 3 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) of the plans for nuclear facilities in the municipality of Varberg in Sweden

The Finnish Environment Institute acknowledges that Finland has received the notification from Sweden on 4 March 2025 in accordance with Article 3 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) regarding the environmental impact assessment (EIA) of the plans for new nuclear facilities in the municipality of Varberg.

The developer, Vattenfall, is planning the development and operation of a new nuclear power plant with two large nuclear reactors, or three to five small modular nuclear reactors, with a combined electrical output of up to 2,800 Mwe (equivalent to no more than 8,400 MW heat output). The permit application will cover only the development and operation of the facility, not the future decommissioning of the new nuclear power reactors. Each nuclear reactor will consist of a reactor and a turbine section. The nuclear reactors considered for the planned operations will be based on light water technology, meaning that enriched uranium is used as fuel and that normal water is used as coolant and moderator.

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 indicate, whether Finland intends to participate in the EIA procedure, and 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 7 March to 8 April 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 has prepared an English summary of the 13 statements received in Finland. The original statements in Finnish or Swedish, which are enclosed to this letter, need to be examined and taken into consideration in the EIA.

Ministry of Economic Affairs and Employment

The Ministry of Economic Affairs and Employment considers it justified for Finland to participate in the EIA procedure for the new Varberg nuclear power plant in Sweden.

The Ministry of Economic Affairs and Employment considers it justified that the environmental impact assessment should include an assessment of the effects of a radiological accident. The ministry views that the assessment method used is appropriate.

Ministry of Social Affairs and Health

The Ministry of Social Affairs and Health does not consider it necessary for Finland to participate in the EIA procedure for the new nuclear power plant to be built in Varberg, Sweden, from the point of view of the effects of a radiological emergency in Finland.

Radiation and Nuclear Safety Authority (STUK)

Radiation and Nuclear Safety Authority (STUK) states that the dose from the accident is very small compared to the annual effective radiation dose for an individual Finnish person, which is 5.9 microsievert (mSv) on average. Furthermore, because of the relatively low doses, the accident would not require any protective measures in Finland.

STUK does not consider it necessary for Finland to participate in the environmental impact assessment procedure for the new nuclear power plant to be built in Varberg, Sweden, regarding the potential radiological consequences for Finland.

VTT Technical Research Centre of Finland

VTT Technical Research Centre of Finland (VTT) views that the project has no transboundary environmental impacts on Finland due to the remote location of the site in relation to Finland. Therefore, VTT does not see any need for Finland to participate in the EIA procedure for the new Varberg nuclear power plant in Sweden.

According to VTT's experts on severe reactor accidents and radioactive dispersion calculations, the project has no environmental impacts that could affect Finland due to the remote location of the site in relation to Finland.

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

Centre for Economic Development, Transport and the Environment of Southwest Finland (ELY Centre) views that under normal circumstances the project will not have any adverse environmental effects in its area of responsibility, as the proposed plant site is located at a considerable distance. The ELY Centre considers that Finland can participate in the EIA



procedure for the project, but the ELY Centre of Southwest Finland does not see the need to participate in the EIA procedure for its area.

The only situation, in which the planned project could have an impact on the Finnish territory, is a theoretical reactor accident and the resulting radioactive radiation.

Finnish Safety and Chemicals Agency (Tukes)

Finnish Safety and Chemicals Agency (Tukes) has no need to participate in the EIA procedure for the new Varberg nuclear power plant in Sweden. From the point of view of chemical safety legislation (390/2005, 685/2015), no impacts on Finland can be identified.

Geological Survey of Finland

According to Geological Survey of Finland (GTK), Finland does not need to participate in the EIA of the new Varberg nuclear power plant in Sweden. The new plant is several hundred kilometres from Finland and the site is in the west of Sweden, not on the Baltic Sea coast.

GTK views that in the event of an accident, the long distance will provide sufficient protection for Finland.

Government of Åland

There is no need for Åland to participate in the EIA procedure. The Government of Åland therefore does not wish to take part in future stages in the matter.

The Government of Åland views that no direct effects will arise for Åland. The documentation shows that only people in Denmark and on the coast of southern Norway can receive lifetime doses above the natural background radiation in the event of a potential radiological accident.

Åland Society for Nature and Environment

1. Åland society for Nature and Environment states that its main objection Vattenfall's plans for new nuclear power is that it cannot possibly be built in the required timeframe from application to production. In the next five years, a significant expansion of electricity production is required, with a further necessary increase during the following five-year period, and therefore new nuclear power is not a solution to the demand for a rapid increase.

In Europe, it takes on average more than ten years from decision to production to build new nuclear power. A related example is the construction of Olkiluoto 3 in Finland: electricity production was supposed to start in 2009 according to the decision, but the start was postponed until 2023. Flamanville 3 in France also suffered an almost equally long delay, with production not starting until 2024. The situation for Hinkley Point C in the UK is similar and electricity production is not expected to start until around 2030. The construction costs of the three reactors have more than doubled compared to the estimates used when the decisions were made.

New nuclear power is on average 4-5 times more expensive than renewables per kilowatt-hour of electricity produced. In addition, from a lifecycle perspective, new nuclear power



causes about 10 times more carbon dioxide emissions (Stanford University 2019) than renewable energy. As recently as 2019, Vattenfall's management announced that nuclear power is too expensive and that the company would not invest in new nuclear reactors. The company now believes this is possible due to the government's decision to inject hundreds of billions into state subsidies and price guarantees for the energy produced, a cost that will be passed on to taxpayers for many decades to come.

The conclusion is that new nuclear power cannot compete either in terms of time or cost with renewable electricity production. Additionally, there is a significant risk that plans for new nuclear power will lead to necessary investments in the rapid expansion of renewable energy being put on hold during the few years we have to reduce carbon dioxide emissions.

Another objection is that the Swedish Radiation Safety Authority announced as recently as February 2025 that the authority has not yet built the expertise needed for the ability to grant permit for new nuclear power, which means that the waiting time for consideration of a possible permit application may be further extended.

Since the process is prolonged, Vattenfall and other prospective companies demand political consensus over time before decisions are made. That discussion has not yet begun. Therefore, the government's promise of 'shovels in the ground' during this term is wishful thinking.

2. Vattenfall states in its application 3-5 modular nuclear power plants as an alternative to conventional nuclear power plants but does not mention that modular nuclear power plants do not yet exist. Today, it is possible to build small individual nuclear power plants, but building nuclear power plants in modules is far in the future and requires significant technological development. According to some researchers, making such operations profitable requires up to a thousand small nuclear power plants.
3. Hydropower and nuclear power are often cited as the only energy sources to balance the energy produced by wind and solar, but today many new technical methods are being developed for this. A major investment in nuclear power would consume the resources necessary for this development, and important time for the development of alternative methods would thus be lost.

One method is currently being developed by Wärtsilä in Finland (article in Hufvudstadsbladet, 5 March 2025). Wärtsilä has developed a model of power systems in the EU that shows that balancing technologies such as reciprocating engines and energy storage will play a crucial role in the EU's energy supply, accounting for 19% of electricity generation in 2030. The company's study shows that these technologies need to be in operation for only a few hours a day to ensure stability.

4. In Vattenfall's application to the environmental authority, the project manager claims that a meltdown in a nuclear power plant is the only thing that can affect countries outside Sweden's borders. This starting point is too narrow, since radioactive emissions to air and water move freely across national borders even if a meltdown does not occur. Considering a meltdown as a hypothetical risk is not correct in the light of the events at Three Mile Island, Chernobyl and Fukushima and the incident at the Forsmark nuclear power plant near Åland on 25 July 2006, when the operators were only able to avoid a meltdown through their skill. Future meltdowns cannot therefore be ruled out.

5. The Värö peninsula, where the Ringhals plants are located, is in contact with the Baltic Sea, which is already one of the most radioactive seas in the world. The planned nuclear reactors, like the existing ones, will be cooled by seawater, which will then slowly become further contaminated.

Vattenfall's failure to explain its plans for the decommissioning of reactors and the final disposal of radioactive waste at the consultation stage is not only deeply worrying - it is unacceptable. A leaking final repository in Forsmark would definitely cause releases that would also affect Åland and Finland.

The final repository for Sweden's collected high-level waste, which is now being constructed in Forsmark, 60 km as the crow flies from Åland's westernmost municipality Eckerö, is based on a highly controversial storage method: the high-level waste is enclosed in copper capsules surrounded by clay and lowered into a cave at a depth of 500 meters under the sea. The repository is expected to remain sealed for at least 100,000 years - a time span that is impossible to imagine and includes several ice ages - until the radioactivity has decayed. The Finnish nuclear waste company Posiva has also been granted permission to build a repository in Olkiluoto based on the same principle.

The most fundamental problem is that the scientific studies carried out by the Swedish Nuclear Fuel and Waste Management Company (SKB) support significant corrosion of copper in a final repository environment, and all the prototype experiments carried out by SKB and Posiva support a corrosion rate that is considerably higher than that assumed by the nuclear waste companies. According to corrosion researchers, the minimum requirement should have been that SKB should have clearly demonstrated with functioning prototypes that the final repository concept works, which has not happened. In plain language, this means that the copper canisters risk rusting and radioactive particles leaking into groundwater and seawater in a fraction of the time the repository is expected to remain sealed.

The Forsmark repository cannot accommodate the waste generated by new nuclear power plants. The question then is how and where the waste will be stored: will a new waste repository be built in Sweden, with all the costs and risks that entails, or is the plan to store the waste in Posiva's repository, thereby affecting the Åland Islands and Finland to the greatest extent? This question must of course be answered in connection with the consultation process. In 2025, SKB will investigate the need for a new final repository using the same storage method. If this is placed in Forsmark, the repository will entail an additional risk of radioactive releases affecting Åland and Finland.

6. One factor that will increase the cost of Vattenfall's planned nuclear power investment is the ever-increasing fees to the nuclear waste fund for the decommissioning of nuclear power plants and the storage of nuclear waste. The fund, which has been underfunded for many years, collected one currency unit per kilowatt-hour of energy produced by the companies in 2020. According to the current proposal, five years later, the fee will be increased to 9.3 currency unit per kilowatt-hour for Ringhals' two existing reactors. This fee will ultimately be added to the customers' electricity bills.



In addition, nuclear power producers must provide collateral for future contributions to the fund, partly to protect themselves against unpredictable costs or price increases. The Swedish National Debt Office wants to increase these costs to a total of 75 billion SEK.

Vattenfall has chosen to exclude this increased cost at this stage, which, together with the government subsidies, distorts the picture of the profitability of nuclear power.

7. Nuclear power, both new and existing, increases vulnerability to various forms of sabotage and attack - a bomb in a nuclear power plant would become a so-called dirty bomb - in the new and dangerous world political situation (cf. Zaporizhzhya in Ukraine). This is a further argument for investing in new, decentralised, green technologies for electricity production instead of vulnerable nuclear power, which is also dependent on imported uranium fuel.
8. Vattenfall has submitted a request to the County Administrative Board that the Biskopshagen nature reserve on the Värö peninsula should be cancelled and that the area should instead make way for the new nuclear power reactors, something that residents in the area are protesting against. The area covers around 85 hectares and has been a nature reserve since 1971. We support the newly formed local advocacy group's fight to preserve Biskopshagen as a Natura 2000 site.

An opinion of a private person 1

It is so far the best idea hatched since environmental thinking came into play. First scrapping and closing down fully functioning power plants was a completely idiotic idea from start to finish. I think it is a very good idea for Finland to be involved; we will need energy, and as we all know, the demand for energy and solutions is only increasing. We read that nuclear power is so bad and that uranium is mined etc. but no one mentions, for example, that most of the solar panels come from Mother Earth — aluminium, silicon, copper and glass all come from the earth and are extracted from there. Yes, some may be recycled but certainly not all.

In any case, I am 110% on board with the idea, and this is the cleanest energy we can get today. Then people talk about the waste from spent uranium. Yes, there is waste, but today there is already technology to utilize it and make, among other things, batteries from it. Imagine having such a battery in an electric car; you would never even need a charger for the car since it has a capacity of about 50 years before the battery is depleted and then completely clean. Not to mention mobiles etc.; imagine never having to charge the mobile etc.

Good thinking from the start and sincerely hope it continues to the end.

An opinion of a private person 2

I support Finland's active participation in the EIA procedure for the Varberg nuclear power plant. Participation ensures careful assessment and supports the responsible development of nuclear power, which I see as essential for a sustainable energy future.

I consider the environmental impacts of the project on Finland to be limited during normal operation, as the planned Varberg nuclear power plant uses proven light water technology. According to the developer, only a hypothetical core meltdown could have transboundary effects. The risk of this is low with modern technology and strict safety requirements. I see the nuclear power plant as an environmentally sustainable energy solution, and any impacts on



Finland can be effectively managed with proper planning. I believe that the advantages outweigh the disadvantages.

I believe that the consultation documents, based on the information presented, provide a sufficient basis for assessing the project. I welcome the focus on modern nuclear power as a sustainable energy source. Overall, I support the project and see the documents as a good starting point.

Ministry of Agriculture and Forestry and **Finnish Institute for Health and Welfare** did not have any comment on the matter.

Participation in the transboundary EIA procedure

The Finnish Environment Institute has received both comments in favor of participation in the EIA procedure and comments that do not see a need for participation. As some respondents, such as the Ministry of Economic Affairs and Employment responsible for nuclear energy in Finland, have recognized the necessity for participation, the Finnish Environment Institute has concluded that there are good grounds for Finland's participation in the EIA procedure. Therefore, the Finnish Environment Institute states that Finland intends to participate in the transboundary EIA procedure for the plans for new nuclear facilities in the municipality of Varberg.

Conclusions

The Finnish Environment Institute considers that it is important to carry out a comprehensive assessment of the consequences of a severe nuclear accident for Finland. For example, the impact on the Finnish environment and citizens must be assessed. The potential risk of a severe nuclear accident should be evaluated using reliable methods. Mitigation measures to prevent a severe nuclear accident should also be presented in the EIA. The Finnish Environment Institute considers it necessary to model the long-range dispersion of a possible nuclear accident in order to assess the significance of its effects on Finland.

The impact of the nuclear power plant on the Baltic Sea should be assessed in sufficient detail, both during normal operation and in the event of an accident.

To conclude, the Finnish Environment Institute would like the EIA documentation to provide a transboundary environmental impact assessment from Finland's perspective.



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

For information

Received statements in Finland

Ministry for the Foreign Affairs
Ministry of the Environment
Ministry of Economic Affairs and Employment
Ministry of Social Affairs and Health
Radiation and Nuclear Safety Authority
VTT Technical Research Centre of Finland
Centre for Economic Development, Transport and the Environment of
Southwest Finland
Finnish Safety and Chemicals Agency
Geological Survey of Finland
Government of Åland
Åland Society for Nature and Environment
Ministry of Agriculture and Forestry
Finnish Institute for Health and Welfare

