



Fennovoima Ltd
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STATEMENT
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ENVIRONMENTAL IMPACT ASSESSMENT PROGRAMME FOR FENNOVOIMA LTD'S NUCLEAR POWER PROJECT; STATEMENT BY THE CONTACT AUTHORITY

On 17 September 2013, Fennovoima Ltd submitted an environmental impact assessment programme (hereinafter referred to as the EIA programme) on a nuclear power project to the Ministry of Employment and the Economy (MEE or the Ministry) in accordance with the environmental assessment procedure (the EIA procedure or EIA), pursuant to the Environmental Impact Assessment Act (468/1994; the EIA Act). Prepared by the organisation responsible for the project, the EIA programme comprises a plan for conducting the requisite studies and for EIA procedure implementation. The EIA programme also includes a description of the present state of the environment in the area likely to be affected.

Pursuant to the EIA Act, the Ministry of Employment and the Economy will act as the contact authority in the EIA procedure.

On 30 September, a notice of the assessment procedure's initiation was published in the newspapers Helsingin Sanomat and Hufvudstadsbladet and in the following local and regional papers: Kalajokilaakso, Kaleva, Keskipohjanmaa, Pyhäjokiseutu and Raahen Seutu.

The public notice, the assessment programme and the comments and opinions received by the MEE during the consultation can be found on the MEE's website at www.tem.fi.

Members of the public were able to view the EIA programme between 30 September and 13 November at the local government offices or environmental offices of the following municipalities: Pyhäjoki, Raahe, Alavieska, Merijärvi, Siikajoki, Oulainen and Kalajoki.

The Ministry organised a public information event together with Fennovoima Ltd, the company responsible for the project, in Pyhäjoki on 17 October 2013.

For a summary of the comments requested and opinions submitted on the EIA programme, see Chapter 3.

The Espoo Convention (67/1997) will also be applied to the assessment of the project's cross-border environmental impacts. The parties to the Espoo Convention have the right to participate in the EIA procedure. The Ministry of the Environment, which is responsible for the practical arrangements of conducting the international consultation, has notified the following countries of the project: Sweden, Denmark, Norway, Germany, Poland, Lithuania, Latvia, Estonia, Russia and Austria.

1 Project details

1.1 Organisation responsible for the project

The organisation responsible for the project is Fennovoima Ltd. Its consultant in the environmental impact assessment procedure was Pöyry Finland Oy.

1.2 Project and project options

Fennovoima is preparing to build a nuclear power station unit on Hanhikivi site in Pyhäjoki. The nuclear power station option under scrutiny, type name AES2006, is a nuclear power station with an electric power output of some 1,200 megawatts and thermal output of 3,200 megawatts. This pressurized water reactor would be supplied by the Russian Rosatom Group.

For the purposes of this report, the 'project' refers to Fennovoima's entire nuclear power plant project.

The project also includes the on-site interim storage of spent nuclear fuel generated by the new unit and the treatment of low and intermediate level waste.

Should the project go ahead, Fennovoima intends to launch the excavation and water engineering works on the site of the new nuclear power station in 2015. The construction period of the new plant is estimated to be some six years.

As a zero option, the EIA report presents a situation in which the project would not go ahead. Fennovoima would not build a power station of another type in lieu of the nuclear power station project. The zero option would entail increasing the import of electricity and/or implementing power plant projects of other organisations in order to meet the corresponding electricity requirements.

2 Licensing procedures and planning of the nuclear power plant

The licensing procedure of nuclear facilities is described in the Nuclear Energy Act. Decision-making and the licensing system are

based on a number of principles, including a continuous review of safety and adding detail to assessments already completed throughout the life cycle of the nuclear facility.

A significant number of other licences are also required for the construction of a nuclear power plant, such as permits in compliance with the Environmental Protection Act and the Water Act, and a building permit granted by the local municipality. All planning phases concerning the nuclear power plant must be completed prior to applying for a building permit and a construction licence granted by the government.

2.1 Environmental impact assessment

Fennovoima will draw up an EIA report based on the assessment programme and the contact authority's statement on the programme, followed by a public hearing on the EIA report. The company expects the EIA report to be completed in February 2014.

The EIA procedure is part of the safety and environmental impact assessment of nuclear power plants associated with the decision-in-principle referred to in the Nuclear Energy Act (NEA 990/1987).

In 2008, Fennovoima implemented an EIA to assess the construction and operating period impacts of a nuclear power plant with an electrical power output of 1500 – 2500 megawatts and comprising one or two reactors on three optional sites, one of which was Pyhäjoki. An international consultation referred to in the Espoo Convention was also implemented in connection with the EIA procedure. The Ministry took this process into consideration when preparing its statement.

As the option that is the object of the current environmental impact assessment was not one of the plant options in the original application for a decision-in-principle, the Ministry of Employment and the Economy requires Fennovoima to bring the project's environmental impact assessment up to date by this EIA procedure. An international consultation referred to in the Espoo Convention will be implemented at the same time.

2.2 Decision-in-principle

The new nuclear power plant complies with the definition of a nuclear facility of considerable general significance referred to in the Nuclear Energy Act requiring the Government's decision-in-principle stating that the construction project is in line with the overall good of society. In accordance with the Nuclear Energy Decree (161/1988, NED), the decision-in-principle shall include, among others, an EIA report complying with the Act on Environmental Impact Assessment Procedure. The scope of the project outlined in the application for a decision-in-principle may not exceed that described in the EIA report.

The processing of an application for a decision-in-principle is not solely based on documents provided by the applicant. The authorities will obtain supplementary reports, both those required pursuant to the Nuclear Energy Decree and other reports deemed necessary, providing a broader analysis of the project. In preparation for processing the application, the Ministry of Employment and the Economy will obtain a statement from the local council of the municipality in which the prospective facility is located, and from its neighbouring municipalities, the Ministry of the Environment and other authorities referred to in the Nuclear Energy Decree. In addition, the Ministry must obtain a preliminary safety assessment of the project from the Radiation and Nuclear Safety Authority (STUK).

A decision-in-principle under Section 11 of the Nuclear Energy Act on Fennovoima's project was made by the Government on 6 May 2010 and upheld by the Parliament on 1 July 2010. However, this decision-in-principle did not address the Rosatom option.

2.3 Construction licence

The actual licensing procedure follows the Government's decision-in-principle. For building a nuclear power plant, a construction licence issued by the Government is required, stating that the construction of the facility is in line with the overall good of society. The prerequisites for granting a building permit also include that the plans concerning the nuclear facility meet adequate safety requirements, that appropriate account has been taken of the safety of workers and the population when planning the operations in question, that the location of the nuclear facility is appropriate with respect to the planned operations, and that environmental protection has been taken into account appropriately when planning operations.

Any decision regarding the construction licence shall describe how the EIA report and the related statement by the contact authority have been taken into account (Section 13 of EIA Act).

In connection with the construction licence application, it will be verified that a site has been reserved for the construction in a local detailed plan and that the applicant is in possession of the site required for the operation of the facility (Section 19(4) of the Nuclear Energy Act). The planning process must therefore have been finalised by this stage (cf. Section 9 of the EIA Act).

A hearing procedure for the relevant municipalities, authorities and citizens will be organised during the application process for the construction licence.

The Government's decision-in-principle adopted on 6 May 2010 laid down as a condition that Fennovoima must apply for a construction licence within five years of the Parliament upholding the decision-in-principle. Fennovoima must thus apply for a construction licence no later than on 30 June 2015.

2.4 Operating licence

A licence to operate a nuclear facility issued by the Government is required to operate a nuclear power plant. In order for such a licence to be granted, the operation of the nuclear facility must be arranged so as to conform with the overall good of society, taking due account of the protection of workers, general safety and environmental protection.

A hearing of municipalities, authorities and citizens will be organised during the operating licence application process.

3 A summary of statements and opinions

A statement on the Environmental Impact Assessment Programme was requested from the following: the Ministry of the Environment, the Ministry for Foreign Affairs, the Ministry of the Interior, the Ministry of Social Affairs and Health, the Ministry of Defence, the Ministry of Finance, the Ministry of Transport and Communications, the Ministry of Agriculture and Forestry, the Finnish Radiation and Nuclear Safety Authority, the Regional State Administrative Agency (AVI) for Northern Finland, the Finnish Environment Institute, the ELY Centre for Northern Ostrobothnia, the Finnish Safety and Chemicals Agency (Tukes), the Regional Council of Northern Ostrobothnia, the Confederation of Finnish Industries EK, Finnish Energy Industries ET, the Central Union of Agricultural Producers and Forest Owners MTK, the Confederation of Unions for Professional and Managerial Staff in Finland Akava, the Central Organisation of Finnish Trade Unions SAK, the Finnish Confederation of Salaried Employees STTK, the Federation of Finnish Enterprises, WWF, Greenpeace, the Finnish Association of Nature Conservation, the National Board of Antiquities, Fingrid Oyj, Posiva Oy, rescue services in the relevant area and the municipalities of Pyhäjoki, Raahe, Alavieska, Merijärvi, Siikajoki, Oulainen and Kalajoki.

The following organisations did not respond to the Ministry of Employment and the Economy's request for a statement: the Ministry for Foreign Affairs, the Central Union of Agricultural Producers and Forest Owners MTK, the Finnish Confederation of Salaried Employees STTK, the Federation of Finnish Enterprises, WWF and the municipalities of Raahe and Alavieska.

In the assessment procedure of cross-border environmental impacts referred to in the Espoo Convention, the Ministry of the Environment notified the authorities of the following countries about the project:

the Swedish Environmental Protection Agency (Sweden), the Ministry of Environment (Denmark), the Ministry of Environment (Norway), the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Germany), the Ministry of Environment (Poland), the Ministry of Environment (Lithuania), the Ministry of Environment (Latvia), the Ministry of Environment

(Estonia), the Ministry of Natural Resources (Russia) and the Federal Ministry of Agriculture, Forestry, Environment and Water Management (Austria).

Sweden, Denmark, Norway, Poland, Germany (the states of Schleswig-Holstein and Niedersachsen), Latvia, Russia, Estonia and Austria are participating in the EIA procedure and have commented on the EIA programme. Lithuania is not taking part in the programme, but it has requested for copies of the EIA report and the prospective construction licence.

3.1 Statements requested by the Ministry of Employment and the Economy from authorities

According to the statement of the *Ministry of Social Affairs and Health*, the EIA programme was expertly drawn up. The Ministry of Social Affairs and Health demands that the new requirements for securing the preparedness arrangements of nuclear power stations included in the proposal for a government decree circulated for comments in spring 2013 be taken into account in the EIA report (the decree entered into force on 25 October 2013). The new requirements increase the total emissions limit of a design-basis accident, while requiring that even in case of a serious accident, no evacuations will be necessary to a distance exceeding five kilometres from the plant. In other respects, the Ministry of Social Affairs and Health had nothing to comment on in the EIA programme.

The Ministry of Defence notes in its statement that the impacts of the smaller plant that is currently being planned will mainly be similar and in the same range or less significant than those of the previous option assessed in 2008.

The Ministry of Finance made no comment on the project.

The Ministry of Transport and Communications noted that as regards transportation of hazardous substances, the Act on the Transport of Dangerous Goods (719/1994) and any decrees issued under it must be complied with when transporting radioactive substances.

The Ministry of Agriculture and Forestry notes that updated information is available on the sea level rise scenarios, and that the situation in 2013 should be verified and the sea level scenario updated if necessary. In addition, the EIA programme should contain a clear statement of the levels at which activities causing hazards will be constructed at the plant in relation to the sea level rise scenarios. Fennovoima intends to assess the operating period impacts on such species as fish, and in particular on migratory fish and fisheries. The Ministry of Agriculture and Forestry finds that for fisheries, it is even more important to also assess the impacts during the construction period.

In the statement submitted by the *Ministry of the Interior*, the Ministry's Rescue Department urges that its statement SM-2008-545/ym-0 on this matter issued in 2008 be taken into consideration.

The Ministry of the Environment notes in its statement that amendments have been made in the marine protection laws since 2008 and proposes modifications in the environmental impact assessment in the EIA programme. The Ministry also reminds the company of the importance of taking the most recent information into account in the assessment and ensuring openness when discussing uncertainties related to long-term effects.

As regards planning, the Ministry of the Environment notes that the information is up to date but asks the company to discuss in the EIA report any additional needs for plan modifications arising from the project and the impacts of such modifications. Regarding nuclear fuel, the Ministry would like a more detailed description of the nuclear waste management measures and the options for organising final disposal, as well as of the risks entailed by the transport of fresh and spent nuclear fuel.

The Ministry also makes five specific and detailed comments on the EIA programme. It further comments on certain ambiguities concerning the cooling periods of spent nuclear fuel and contract law applicable to the plant.

Finally, the Ministry of the Environment stresses that even if the document is an update of the previous EIA report, the new report must be an independent document on the project and its environmental impacts. Existing new information must also be fully exploited, and compliance with any new legislation must be ensured.

While *the Radiation and Nuclear Safety Authority* (STUK) takes into consideration the previous EIA procedure in its statement, it reiterates in some parts its prior statement in order to ensure that an extensive environmental impact assessment will be implemented. Fennovoima's EIA programme covers any issues that are relevant to the Radiation and Nuclear Safety Authority's remit. The EIA programme should be made more specific regarding the power plant description, restricting emissions, and the design basis and design objectives of environmental impacts, and it must contain an evaluation of the possibilities of meeting the existing safety requirements.

The EIA report should examine questions related to site suitability and selection and nuclear waste management options. Nuclear waste management measures implemented in the power plant area must be comprehensively described, including their environmental and radiation impacts.

The Radiation and Nuclear Safety Authority's statement contains miscellaneous comments on making the project description more specific regarding organisation, quality and environmental objectives, and the plant option. The Radiation and Nuclear Safety Authority stresses compliance with new decrees, guidelines and requirements in the EIA report. The report must refer to existing decrees and describe the impacts any amendments have on the project.

The Authority would also like complementary information in the section on the preparedness system. Preparedness and action in emergencies in compliance with legislation and the Radiation and Nuclear Safety Authority's guidelines must be described and specified more clearly.

Regarding the location of the plant, Fennovoima should describe accurately in the EIA report the distribution of population in the vicinity of the plant and specify the nearest vulnerable facilities, including schools, day-care centres and hospitals.

The EIA programme does not contain an estimate of the maximum fuel charge in the reactor and its average burn-up. These values must be given in the EIA report, as they are relevant to the radioactive emissions in case of an accident.

A summary of what the information is based on must be given for the assessment of operating period radioactive emissions and the impacts of accidents and emergencies. The fact that since Fennovoima's previous EIA procedure was completed, a new government decree on the safety of nuclear facilities and a new guideline on restricting emissions from nuclear facilities by the Nuclear and Radiation Safety Authority have entered into force in the course of the procedure, and these should be taken into account when drawing up the assessment and the report, in particular regarding serious accidents.

The EIA report must contain an assessment of whether the current and foreseeable natural conditions will have an impact on the power plant's safety, the spreading of radioactive substances in the environment and site selection. The results of the so-called basic state assessment of Hanhikivenniemi area should be described in the EIA report.

Sea and air transport routes and any impacts caused by the planned site should be described in the EIA report.

The *Finnish Safety and Chemicals Agency* (Tukes) had nothing to comment on in the updated EIA programme. The risks entailed in the processing and storage of hazardous chemicals and preparedness for accidents will be processed at Tukes during the application procedure under the Chemicals Safety Act.

In its statement, *the Regional State Administrative Agency for Northern Finland* considers the EIA programme comprehensive in terms of impacts on humans. However, the Agency stresses that such factors as accident risks, storage of spent nuclear fuel and power plant waste and construction-period impacts should be taken into account in the assessment.

The ELY Centre for Northern Ostrobothnia notes that the EIA report should focus specific attention on whether or not the project under scrutiny results in a need to modify existing or pending plans. As planning procedures are time-consuming, information on any needs to modify the plans should be available as early as possible. In its previous statements, the ELY Centre noted that the long-term impacts of the project are difficult to foresee and that these impacts concern Takaranta flood meadows to the north of Hanhikivi peninsula, forests on the land uplift coast, changes near Heinikarinpampi lake and power lines that expose birds to collision risks. The EIA procedure for the power line project will eventually produce more information on the last point. The other points should be examined during the EIA procedure for the project under scrutiny. According to the ELY Centre, the latest climate scenarios and their impacts on sea levels should be taken into account in the EIA procedure when assessing flood levels.

The National Board of Antiquities brings up the need to provide an adequate protection zone for Hanhikivi boundary stone that is of national significance and that is protected under the Antiquities Act in its statement. This stone lies on the very edge of the construction site EN-1 permitted in previous plans, and unobstructed access to the stone must be secured in all circumstances. The boundary line between Pyhäjoki and Raahe and the view to the direction of the sea should also be kept clear to understand the site. The Board of Antiquities also notes that an assessment focusing on the power line corridor will be needed in connection with the more detailed planning.

The local rescue services note that while safety issues have been taken into consideration in the EIA programme, construction period risks and the management of day-to-day risks have received less attention. The rescue services would like to see a versatile risk analysis included as part of the section on construction period safety in the report, and a study of the impacts of a major accident within a 5-kilometre and a 20-kilometre radius. The rescue services would also like a preliminary plan for the establishment of a safety organisation for the project and its schedule.

The Regional Council of Northern Ostrobothnia finds that the programme clearly shows how the project has evolved since the EIA conducted in 2008. The EIA programme is a clear whole and lays a good foundation for presenting the project's impacts in greater detail. The impacts of the power plant project were extensively assessed in connection with the previous EIA and the planning process concerning the area, and it is thus justified to focus on describing key differences in the impacts when assessing the new option.

Pyhäjoki municipality had nothing to comment on in the EIA programme for Fennovoima's nuclear power station.

The towns of Kalajoki and Oulainen and the municipality of Merijärvi had no comments to make on the EIA programme for Fennovoima's nuclear power station.

In its statement, *the municipality of Siikajoki* finds that the EIA programme put forward by Fennovoima is now comprehensive, and if conducted following the programme, the assessment will make it possible to obtain adequate information on the project's environmental impacts for the purposes of a later consideration of applications for licences and permits. The municipality stresses that a careful assessment of cooling water use will be vital in this relatively shallow and cut-off coastal area of the Gulf of Bothnia. The municipality finally notes that the project is of great importance for Siikajoki and its residents.

3.2 Other statements requested by the MEE

The Confederation of Finnish Industries had nothing to comment on in Fennovoima's EIA programme.

Finnish Energy Industries notes that the EIA programme is comprehensive and expertly prepared, and that the plan for assessing the project's environmental impacts is adequate. According to Finnish Energy Industries, Finland needs additional electricity production capacity to secure the supply of emission-free power in the future, and Fennovoima's project supports both this objective and the emission reduction targets.

Fingrid Oyj notes in its statement that Fingrid has worked together with Fennovoima to study the connection of the power plant project referred to in the decision-in-principle to the national grid on the basis of plant design data submitted by Fennovoima. The need to increase emergency power capacity resulting from Fennovoima's nuclear power plant project will be clarified as the planning progresses, and in its land use plans, Fennovoima has made allowance for locating an emergency power plant on the site.

The Central Organisation of Finnish Trade Unions SAK finds that the EIA programme for Fennovoima's project was expertly drawn up and compliant with the relevant legislation. The project will have a positive impact on climate policy and the energy market, and the plant is no less necessary now than it was in 2008. This fact and its justifications should be brought up in the EIA report. According to the Central Organisation of Finnish Trade Unions SAK, the EIA programme stresses operating period impacts, and it would also be justified to address the construction period impacts on employment and social conditions in adequate detail in the EIA report.

The Confederation of Unions for Professional and Managerial Staff in Finland Akava found nothing to comment on in Fennovoima's project.

In its statement, *Posiva Oy* notes that rather than assume responsibility for the final disposal of all spent nuclear fuel produced in Finland, it is only tasked with managing the final disposal of spent nuclear fuel produced by its owners Fortum Power and Heat Oy (FPH) and Teollisuuden Voima Oyj (TVO).

Greenpeace highlights in its statement the need to take the changes that have taken place since the previous EIA programme was drawn up into consideration in the current EIA procedure. According to *Greenpeace's* statement, these changes include a more detailed idea of the impacts of a serious nuclear accident, forecasts indicating a more moderate increase in electricity consumption, the change of plant type and supplier, the more specific site location and the negative views of *Posiva's* current owners of nuclear waste storage.

The EIA programme should also contain an assessment of an INES 7 class accident, including its impacts in all possible weather conditions and the ensuing evacuation needs. The need for emergency power and impacts on the national grid should also be assessed in case of unexpected plant shutdown, and preparedness for natural disasters should be examined, taking into consideration any impacts of climate change during the plant's life cycle. Regarding procurements of nuclear fuel, *Greenpeace* would like to see an evaluation of alternative suppliers over the entire life cycle of the plant and a report on the properties of nuclear fuel, its suitability for different final disposal solutions of spent nuclear fuel and the possible use of mixed oxide fuel.

The Finnish Association of Nature Conservation (SLL) finds that while *Fennovoima's* project and its operating environment have undergone a considerable change, the EIA programme is general in its nature, and its justifications have remained unchanged since the 2008 document. *SLL* stresses the need to take the overall interests of society into consideration in the EIA report.

SLL does not consider a continuous growth of domestic electricity consumption a credible trend and highlights the possibilities of saving energy and improving energy efficiency. In its statement, *SLL* thus calls for more accurate forecasts of future energy trends and calculations based on recent consumption figures and forecasts. *SLL* also considers any export of electricity produced with nuclear power a problem in terms of sharing the benefits and negative effects.

Regarding the environmental impacts, *SLL* would like *Fennovoima* to produce reference figures on radioactive emissions into water and air from other Rosatom plants. *SLL* also finds the description of cooling water intake unclear and notes that no information or reports are provided on dredging the harbour basin. In the context of other water management, *SLL* highlights ambiguities in the procurement of process water and queries how the company intends to organise the procurement of fresh water.

SLL considers the site too low for a nuclear power plant and notes that the impacts of road alignment and raising the road level on the landscape and the natural state of the surrounding area have so far not been assessed, and requests that these aspects be assessed in the new EIA report.

3.3 International consultation statements

Sweden's environmental authority, *Naturvårdsverket*, held a public hearing before drawing up its statement. It received comments from 15 authorities and 13 organisations, and 23 comments or opinions from private individuals.

Naturvårdsverket includes a summary of these comments and views in its statement.

The Swedish radiation safety authority, *Strålsäkerhetsmyndigheten SSM*, has no comments to make on the EIA programme and notes that it has nothing new to add to its statement on the assessment dating back to 2008.

The Swedish meteorological institute, *Sveriges meteorologiska och hydrologiska institut SMHI*, notes in its statement that as a result of serious reactor accidents, radioactive emissions spread over a very large area. Restricting the examination proposed in the EIA programme to a radius of 1,000 kilometres from Pyhäjoki is thus inadequate, and the examination of the geographical distribution of radioactive substances should be extended. SMHI also focuses attention on normal operating period emissions, especially in sea water, and the risks caused by any port activities.

Länsstyrelsen i Norrbotten län draws attention to climate change in its statement and calls for the inclusion of a long-term examination of sea level fluctuations and extreme weather phenomena in the EIA report. The other provincial governments that issued a statement were Västerbotten, Västernorrland, Gävleborg and Uppland.

In a statement representing 13 NGOs, 5 political party organisations and certain private persons, *Nätverket kärnkraftfritt Bottenviken* expresses its deep concern over the project. It focuses attention on the impacts of power plant cooling water on the waters in the Gulf of Bothnia and, for example, the roe of Sea of Bothnia vendace (*Kalixlöjrom*), the impacts of pack ice and the accident assessments to be conducted.

In *Skellefteå*, a list of some 1,000 signatures has been collected by a number of local and regional environmental organisations, organisations objecting to nuclear power and political parties. The signatories submit a list of 22 items on which they require additional information in the EIA report. These are relevant to the environment in the Gulf of Bothnia, radioactive and thermal emissions, the entire uranium exploitation chain from uranium mining to the final disposal

of spent nuclear fuel and the consequences of an INES 7 class accident.

The *Norwegian* environmental authority, or the *Ministry of Environment*, passes on the statement of the Norwegian radiation safety authority *Statens strålevern*, which welcomes the fact that the new EIA also assesses the impacts of radioactive emissions from any serious reactor accident on a radius of up to 1,000 kilometres. The Norwegian authorities are participating in the assessment process and will comment on the EIA report as necessary.

The *Danish* environmental authority, the *Ministry of Environment Agency*, announces that Denmark will take part in the EIA. It attaches to its statement the comments of four other authorities and two organisations.

In *Germany*, the *Ministry of Energy, Agriculture, the Environment and Rural Areas Schleswig-Holstein* announces in its statement that it is the competent authority in this matter. The state notes that the new power plant type will influence the environmental impacts, and the state puts to Fennovoima questions concerning the behaviour in accidents of the power plant type under scrutiny and, for example, its ability to resist external forces. The state is also interested in the transport of both fresh and spent nuclear fuel and its possible impacts on the state.

The *state of Niedersachsen* also announced that it would take part in the procedure and that it was interested in any cross-border environmental impacts.

The *Polish environmental authority* announces in its statement that Poland will take part in the EIA.

The *Russian Ministry of Natural Resources and Environmental Protection* announces that it will potentially take part in the EIA process.

The *Estonian Ministry of Environment*, which is the competent environmental authority in Estonia, announces that it will take part in the international assessment of environmental impacts and stresses that it is particularly interested in discussing accidents that could affect Estonia.

The *Latvian Ministry of Environment* announces in its statement that the country will take part in the EIA process.

The *Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management* sent the Finnish government a letter in which the country registers its interest in taking part in the EIA procedure. The country also reports that it will strive to organise a public hearing on the EIA report in Austria.

Attached to the letter is Environment Agency Austria's report "NPP Fennovoima (Hanhikivi 1) Expert Statement to the EIA Program", Vienna 2013. This report also contains comments on the EIA programme. In practice, Austria calls for an assessment of any possible impacts of Fennovoima's project on Austria. In this assessment, the so-called worst case scenario source terms should be used for the basis of assessing radioactive emissions. According to this report, the accident source term 100 TBq Cs-137 used by Fennovoima is not adequate. The report proposes source terms that would have impacts on the Austrian soil.

The report also calls for additional information about the safety of the AES2006 plant and notes that this plant type is not yet in operation anywhere, even if four plant units of this type are under construction in Russia.

3.4 Other comments and opinions

This section contains a summary of issues and views that were brought up or highlighted in other comments and opinions. In total, 24 other comments and opinions were submitted. Of these, four came from Finnish organisations, and twenty from private persons.

The association *Pro Hanhikivi* proposes in its comment that Fennovoima's nuclear power station project has changed to the extent that it can be said to have returned to square one.

Pro Hanhikivi calls for Fennovoima to take the following themes into account when drawing up the EIA report: 1) more details must be provided about Fennovoima's owners, 2) the responsibilities of the company producing electricity should be described, 3) the company's nuclear power competence must be established, 4) the employment impacts must be studied, 5) the impacts of refusals of any applications for compulsory purchase orders must be examined, 6) a proposal for the connection to the national grid should be presented, 7) the solutions for nuclear waste management must be addressed in greater detail, and 8) information on the need for emergency power and regulating power must be provided.

Pro Hanhikivi also lists requirements concerning the EIA procedure, communication and participation during the project, the options to be assessed and project description, the current state of the environment and the methods to be used. The description of alleviating the negative effects should be more detailed, and for the part of monitoring the project's impacts, the manner in which the follow-up of the 2008 environment impact assessment has been implemented should be described with examples.

Raahe District Development Center states in its comment that throughout the period in which it has been operating, Fennovoima has actively kept in touch with the actors and organisations in the area and openly communicated about the progress of the project

and, for example, environmental studies and reports conducted in the project area. The company is highly appreciated in the economic area because of this openness and operating policy. The Development Center feels that Hanhikivi 1 construction project will provide the economic area's business life and, more extensively, the entire region of Northern Finland a unique opportunity of being involved in a major international investment in its home field.

BusinessOulu notes that the regional multiplier effects of Fennovoima's nuclear power plant project on employment, the economy and other socioeconomic aspects, including increasing internationality, should be assessed in the EIA to be prepared to the extent warranted by their importance.

In their statement, the *Naiset Atomivoimaa Vastaan* and *Naiset Rauhan Puolesta* movements object to the building of additional nuclear capacity in both Finland and elsewhere. The construction and operation of nuclear power units entails a number of unsolved problems, including the final disposal of waste and the restricted uranium resources. The operation of a nuclear power station always involves the risk of a serious nuclear accident, in which large quantities of radioactive substances are released in the environment.

In her comment, *Päivi Krekelä* highlights such questions as the final disposal of spent nuclear fuel, the procurement of nuclear fuel and the environmental impacts of these activities. The comment also brings up a need for additional studies concerning impacts on the environment, humans and society. The comment also asks Fennovoima to provide information on the project's impacts on power supply networks and the Finnish energy market, taking into consideration the current forecasts of electricity consumption, which are more moderate than those produced in 2008.

According to a comment by *Soili and Jari Kauppila*, the safety risks inherent in the low elevation on the plant site must be examined. The comment also calls for a clear plan for the safety of interim storage and final disposal of nuclear waste. The comment also urges that such other impacts of the project should be assessed as its impact on the comfort of living, engaging in a trade, safety and the social situation, as well as the impact on constitutional rights of the compulsive purchase applications. The comment also highlights the need to organise a resident survey for the villagers and free-time residents in Parhalahti.

The other comments and opinions submitted by private persons in part discuss the same themes and impacts as those described above. The comments and opinions submitted also requested additional studies on such topics as the obligations of the municipality, the impacts of any accidents, and insurance and compensation in the aftermath of a potential accident. Rather than express views relating to the EIA programme, some comments and opinions oppose the use of nuclear energy in general.

In other countries, two organisations and five private persons submitted their comments or opinions.

The Swedish NGO *MKG - Miljöorganisationernas kärnavfallsgranskning* focuses on the handling and final disposal of spent nuclear fuel in its comment. In the opinion of this organisation, the long-term sustainable and environmentally acceptable final disposal of nuclear waste must be secured when building a new nuclear power station. The organisation also notes that the EIA programme contains little or no information on how Fennovoima plans to manage the handling of spent nuclear fuel and other nuclear waste. The organisation expresses its concern over uncertainties associated with the processing of licenses to use nuclear fuel both in Sweden and in Finland.

The German organisation *Bürgerinitiative Umweltschutz Lüchow-Dannenberg* proposes in its statement that a hearing on the EIA programme be also organised in Germany. The organisation refers to the Espoo and Århus Conventions. The comment also contains a programme of ten items for additional studies, including an assessment of an INES 7 level accident and a more detailed discussion of nuclear waste management. The organisation is opposed to the construction of a nuclear power plant in Pyhäjoki.

In addition, five private persons having submitted their comments or opinions in German focused attention on a hearing in Germany, similarly to what *Bürgerinitiative Umweltschutz Lüchow-Dannenberg* proposes in its comment. These comments from private persons also contain the aforementioned list of ten requirements.

4 Statement of the contact authority

The Ministry of Employment and the Economy notes that Fennovoima's EIA programme meets the requirements set out in EIA legislation as to its contents and has been processed in the manner required by the legislation. In the comments submitted, the programme is mainly considered appropriate and comprehensive. However, the Ministry reminds the responsible organisation that all points made by the contact authority in this Chapter should be appropriately taken into account when reviewing the EIA programme and drawing up the EIA report.

The organisation responsible for the project should also take into account the additional questions, notes and views presented in the comments and opinions, to the extent this is necessary in order to prepare the EIA report. In the EIA report, the organisation responsible for the project must strive to appropriately and adequately respond to the questions brought up, taking into consideration the requirements laid down in the EIA Act and decree for the contents of an EIA report.

Any clear shortcomings or incorrect information that the comments and opinions have identified in the EIA programme must be corrected. The Ministry proposes that the organisation responsible for the project attach to the EIA report a table in which issues brought up by the contact authority, the organisation's responses to them and any references to the relevant section of the EIA report are set out.

In addition, any questions put forward in the international consultation must also be answered in the English version of the EIA report. The material to be translated into the languages of the relevant countries must be sufficient and include the information referred to in Annex II of the Espoo Convention. The EIA report shall include, as a specific chapter, a description of cross-border impacts. The documentation shall indicate how the comments of the countries participating in the EIA procedure within the framework of the Espoo Convention have been taken into consideration. Particular attention should be focused on the statements of various organisation in Sweden as a neighbouring country.

The EIA must contain as versatile a comparison as possible of the project's various implementation options, and this comparison must be included in the EIA report.

4.1 Project description and options

The EIA programme shortly describes the power output and type of the prospective power station. The operating principle of the pressurized water plant is also explained.

The Ministry requires that the company include an in-depth technical specification of the selected plant type in the EIA report. Similarly, the safety planning criteria for this nuclear power plant type must be presented regarding the limitation of emissions of radioactive substances and environmental impacts, as well as an assessment of the possibilities of meeting the safety requirements in force. The Ministry considers that it would be a benefit to the project if the EIA report contained a short presentation of Fennovoima's ownership structure and project funding.

Several comments and opinions draw attention to the location of built-up areas in the plant's vicinity. The Ministry finds that the EIA report should contain an illustrative description of where built-up areas will be located in the vicinity of the power plant and a description of the exclusion zone and its impacts on the residents. A general description of possible evacuation measures must also be provided. The on-going compulsory purchasing procedures of certain land areas and any unfinished planning issues should also be described.

The EIA programme shortly describes the so-called zero alternative, in which the increasing demand for electricity in Finland would be

covered by growing imports or the power plant projects of other actors.

However, several statements also suggest that in addition to the aforementioned aspects, saving energy and more effective energy use as well as other options for producing electricity should be examined. The Ministry notes that the organisation responsible for the project is a company that only generates power for its shareholders. In other words, the company itself has limited possibilities of taking significant action to conserve energy or to improve the efficiency of energy consumption. The Ministry considers that the assessment report could briefly assess the energy efficiency and conservation efforts undertaken by the project owners.

4.2 Impacts and their assessment

The EIA programme proposes an assessment of the impacts of cooling and waste water and water intake on water quality, biology and fishes, in particularly migratory fish populations and fisheries as well as on other organisms. Compliance with marine protection legislation reformed pursuant to the EU Marine Strategy Framework Directive (2008/56/EY) must be ensured. The impacts of the project on organisms and, for example, protected species in the land area must be described adequately.

The Ministry considers that the impacts of cooling waters form the most significant environmental impact during normal nuclear power plant operation. Consequently, in models aiming to analyse the environmental impacts of sea water warming, any background material available must be utilised extensively. The calculations regarding cooling waters must be presented conservatively. Any uncertainties in calculation results must be clearly illustrated. The dispersion calculations must be presented in concrete terms, and the methods used for dispersion modelling must be described.

Transfer connections must be developed for the new power station, and the plant must be connected to the national grid. Fingrid Oyj has investigated how the nuclear power plant could be connected to the national grid and examined the reinforcement of the grid based on information on the plant received from Fennovoima. A separate EIA will be carried out on connecting the plant to the national grid in 2014.

Assessing the impacts of exceptional circumstances and emergencies must not be limited to the exclusion area or the emergency planning zone for rescue operations. The Ministry considers that the EIA report should contain various accident scenarios involving radioactive emissions and, with the help of illustrative examples, describe the extent of the affected zones and the impact of emissions on people and nature.

The assessment may draw on the International Nuclear and Radiological Event Scale (INES) of the International Atomic Energy Agency (IAEA), and the EIA must contain a clear summary of what the assessments are based on. The EIA report must also contain a description of the measures taken in the aftermath of any serious reactor accident. The assessment must also include a review of the possible environmental impact of radioactive substances on the states around the Baltic Sea and on Norway and Austria.

In Finland, Section 10 of government decree on the safety of nuclear power stations (717/2013) sets 100 TBq of cesium-137 emissions as the threshold for a serious accidents, and this value has been used as the source term that describes an INES 6 class accident in Finnish environmental impact assessments. Several comments and opinions also suggested that the assessment should cover an INES 7 class accident. The Ministry of Employment and the Economy finds it appropriate that the organisation responsible for the project should present a comparison between the assessment used in Finland and an assessment covering an INES 7 class accident.

As exceptional situations, any potential phenomena caused by climate change and preparedness for such phenomena should also be assessed (sea level fluctuations and other exceptional weather phenomena), which were referred to in several comments. The impacts of land uplift and pack ice occurring in the area must also be taken into account.

The socioeconomic assessments related to the EIA procedure should address such aspects as the employment impacts, which the public information event on the EIA programme called for, both during the construction and the operating period, taking the special features of all municipalities and areas into account. The methods used must be described, and their selection justified.

According to the EIA programme, the organisation responsible for the project will examine the environmental impacts of nuclear fuel production and transport, including the mining and enrichment of raw uranium, conversion, isotope separation and nuclear fuel manufacturing. The EIA is based on existing studies. The Ministry finds it reasonable that the organisation responsible for the project should examine the environmental impacts of the entire nuclear fuel supply chain at a general level and, additionally, the company's opportunities of influencing this chain. Any possibilities of using mixed oxide fuel must also be described.

4.3 Nuclear waste management

The Ministry of Employment and the Economy considers that the report should look at nuclear waste management as a whole. In order to produce a general picture, it would also be appropriate to examine the management of power plant waste at an adequate level. The examination must also analyse the handling of nuclear power

plant demolition waste. The structure of the final disposal facility must be clarified, for example with suitable illustrations.

The management of spent nuclear fuel must be described at a similar general level as the management of nuclear fuel. The management of spent nuclear fuel at the plant site must be described, and a visualisation must be included in the description of the interim storage of spent nuclear fuel. The description of spent nuclear waste management must also cover the potential transport of spent nuclear waste from Pyhäjoki.

The Ministry notes that according to Fennovoima's EIA programme, the company's environmental impact assessment for the project does not cover the final disposal of spent nuclear waste. This is permitted under the Nuclear Energy Act. A separate EIA must thus be carried out for the final disposal of spent nuclear fuel in Fennovoima's project, as the company's plans for organising nuclear waste management take a more definite shape. However, the EIA report must describe the progress made in Fennovoima's plans for spent nuclear fuel management since 2008.

4.4 Plan for the EIA procedure and participation

The Ministry considers that the arrangements for participation during the EIA procedure can be made as presented in the EIA programme. However, the communications and interaction should be adequately addressed to the entire area that the project affects, across municipal borders and covering all population groups. The Ministry further requests that the responsible organisation consider ways of presenting the impact of participation in the EIA report. The sampling and implementation methods of the resident survey carried out and their use must be justified in the EIA report. Any shortcomings observed and the manner in which these will be redressed must also be discussed.

Once the EIA report has been completed, the Ministry of Employment and the Economy will publish a public notice, make the report available, and invite various authorities to comment on the report. The statement on the EIA report prepared by the Ministry of Employment and the Economy in its capacity as the contact authority will be delivered to the municipalities in the relevant area and to the appropriate authorities.

5 Communication about the statement

The Ministry of Employment and the Economy will deliver its statement on the EIA programme to those authorities which have submitted statements and the organisations which have been invited to submit a comment. The statement will be available in Finnish and Swedish on the Internet at www.tem.fi.

The Ministry will provide copies of the comments and opinions concerning the EIA programme to the organisation responsible for the project. All comments and opinions received by the Ministry can also be accessed on the Internet.

The original documents will be kept on file in the Ministry's archives.

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Minister of Economic Affairs

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For information:

Authorities having submitted a statement, the organisations from which the Ministry requested a comment and the organisations having submitted comments