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Fortum Power and Heat Oy

**ENVIRONMENTAL IMPACT ASSESSMENT PROGRAMME FOR THE LOVIISA 3  
NUCLEAR POWER PLANT UNIT; STATEMENT BY THE CONTACT AUTHORITY**

On 26 June 2007, Fortum Power and Heat Oy submitted an environmental impact assessment programme (the EIA programme) to the Ministry of Trade and Industry (MTI) in accordance with the environmental assessment procedure (hereinafter the EIA procedure), pursuant to the Environmental Impact Assessment Act (468/1994; EIA Act), on the third unit of the Loviisa nuclear power plant and the related projects. Prepared by the organisation responsible for the project, the EIA programme presents a plan for the necessary studies and implementation of the EIA procedure. 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 MTI will act as the contact authority in the EIA procedure.

A public notice announcing the launch of the EIA procedure was published on 29 June 2007 in the following newspapers: *Helsingin Sanomat*, *Hufvudstadsbladet*, *Loviisan Sanomat*, *Östra Nyland*, *Borgåbladet*, *Etelä-Suomen Sanomat*, *Kymen Sanomat* and *Uusimaa*. The public notice and the EIA programme can be found on the MTI website at [www.ktm.fi](http://www.ktm.fi).

Members of the public were able to view the assessment programme between 2 July and 17 September 2007 in the local government offices of Loviisa, Lapinjärvi, Liljendal, Pernaja, Pyhtää and Ruotsinpyhtää. Together with the organisation responsible for the project, the Ministry organised a public meeting to discuss the project on 23 August 2007 in Loviisa.

The comments and opinions invited and presented on the assessment programme are described in Chapter 3.

The Espoo Convention (67/1997) will 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

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the Environment is responsible for the practical arrangements for conducting the international hearing. The Ministry of the Environment has notified the following countries of the project: Sweden, Denmark, Norway, Germany, Poland, Lithuania, Latvia, Estonia and Russia.

## **1 Project information**

### **1.1 Organisation responsible for the project**

The organisation responsible for the project is Fortum Power and Heat Oy, which holds the operating licences for the two present units in the Loviisa nuclear power plant until 2027 and 2030 respectively. Fortum Power and Heat Oy is a subsidiary wholly owned by Fortum Oyj.

### **1.2 Project and its alternatives**

Fortum Power and Heat Oy is exploring opportunities to expand the nuclear power plant, located on the island of Hästholmen in Loviisa, with a third nuclear plant unit. The purpose of the project is to increase power production capacity, both to satisfy demand and replace capacity about to be withdrawn from the market.

The electrical output of the planned unit will range from 1,000 to 1,800 megawatts and the thermal power from 2,800 to 4,600 megawatts. A pressurised water reactor and a boiling water reactor are both being considered. The Loviisa 3 unit is designed as a base-load power plant and, excluding an annual service shutdown, it will run continuously throughout the year. The unit has an estimated technical life cycle of approximately 60 years.

In addition to the nuclear power plant, the project includes the intermediate onsite storage of spent nuclear fuel generated by the new unit, the treatment, storage and disposal of low- and intermediate level radioactive waste, the decommissioning of the power plant, and treatment and disposal of waste generated by the decommissioning. The project will require an overhaul of the Loviisa power plant's raw water supply system, extension of the present sewage works and construction of a loading area for sea transport. The implementation of power transmission to the national grid is also included in the project.

A situation in which the Loviisa 3 project would not be implemented is regarded as a zero option. Since Fortum would not consider building another type of power plant on the Loviisa plot instead of the new nuclear power plant unit, the zero option would entail Fortum acquiring new production capacity elsewhere or buying electricity in order to sell it.

The limitation of the alternatives is made on the basis of the importance of utilising existing infrastructure in nuclear plant projects.

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According to Fortum Power and Heat Oy's plans, the construction of the nuclear power plant would take place between 2012 and 2018 or thereabouts.

## **2 Licensing of nuclear facilities**

Pursuant to the Nuclear Energy Act, the decision-making and licensing system is based on a principle whereby safety is continuously reviewed, the assessments being further defined throughout the procedure so that the final safety assessments are only made at the operating licensing stage.

### **2.1 Environmental impact assessment**

Fortum Power and Heat Oy will draw up an environmental impact assessment report (the EIA report) based on the EIA programme and the contact authority's statement; this will be followed by a public hearing on the EIA report. The responsible organisation estimates that the EIA report will be finished in spring 2008.

The EIA procedure constitutes part of the safety and environmental impact assessment for nuclear power plants laid down in a decision-in-principle pursuant to the Nuclear Energy Act (990/1987).

### **2.2 Decision-in-principle**

The planned nuclear power unit complies with the definition of a nuclear power plant of considerable general significance, as laid down in the Nuclear Energy Act, requiring the Government's project-specific decision-in-principle on whether the construction project is in line with the overall interests of society. In accordance with the Nuclear Energy Decree (161/1988), the decision-in-principle shall include an EIA report complying with the Environmental Impact Assessment Act. The scope of the project, outlined in the application for the decision-in-principle, may not exceed that described in the EIA report.

The application for the decision-in-principle is not solely based on the material provided by the applicant. The authorities will acquire 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 the processing of the application, the MTI will obtain a statement from the council of the local authority intended to be the site of the power plant, and from its neighbouring local authorities, the Ministry of the Environment and other authorities, as laid down in the Nuclear Energy Decree. In addition, the MTI will obtain a preliminary safety assessment from the Radiation and Nuclear Safety Authority (STUK).

The MTI will provide local authorities, residents and municipalities in the immediate vicinity of the power plant with an opportunity to express their opinions in writing before the decision-in-principle is made. The Ministry will arrange a meeting, where members of the public will have the opportu-

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nity to express their opinions verbally or in writing. These responses will be submitted to the Government.

Pursuant to the Nuclear Energy Act, before making the decision-in-principle, the Government shall ascertain whether the municipality where it is planned that the nuclear power plant will be located (Loviisa) is in favour of the power plant, and that no facts indicating a lack of sufficient prerequisites for constructing and using a nuclear power plant in a safe manner and not causing injury to people, or damage to the environment or property, have arisen in the statement from STUK or elsewhere during the processing of the application. The Government's decision-in-principle shall be forwarded, without delay, to Parliament for perusal. Parliament may reverse the decision-in-principle or decide that it should remain in force as it stands.

### **2.3 Construction licence**

The actual licensing procedure follows the Government's decision-in-principle. Construction of the nuclear power plant requires a licence issued by the Government, stating that the construction project is in line with the overall interests of society. Furthermore, sufficient safety, protection of workers, the population's safety and environmental protection measures must have been taken into account appropriately when planning the operations, and the location of the nuclear power plant must be appropriate with respect to the safety of said operations.

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

### **2.4 Operating licence**

Operation of a nuclear power plant requires a licence issued by the Government. In order to receive a licence, the operation of the nuclear facility must be arranged so that it is in line with the overall interests of society, and so that the protection of workers, safety and environmental protection have been taken into account as appropriate.

A hearing procedure involving municipalities, authorities and citizens will be established during the operating licence application process.

## **3 Summary of comments and opinions**

The following organisations were invited to comment on the EIA programme:

Ministry of the Environment, Ministry of the Interior, Ministry of Social Affairs and Health, Ministry of Defence, Ministry of Finance, Ministry of Transport and Communications, Ministry of Labour, Ministry of Agriculture and Forestry, Ministry for Foreign Affairs, State Provincial Office of Southern Finland, Regional Council of Itä-Uusimaa, Eastern Uusimaa Fire and

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Rescue Services, Western Finland Environmental Permit Authority, Finnish Environment Institute, Radiation and Nuclear Safety Authority, Safety Technology Authority, Uusimaa T&E Centre, Occupational Safety and Health Inspectorate of Uusimaa, Regional Environment Centre of Uusimaa, City of Loviisa, Municipality of Lapinjärvi, Municipality of Liljendal, Municipality of Pernaja, Municipality of Pyhtää, Municipality of Ruotsinpyhtää, Confederation of Unions for Professional and Managerial Staff in Finland (AKAVA), Confederation of Finnish Industries EK, Finnish Energy Industries, Greenpeace, Loviisan puolesta ry, Central Union of Agricultural Producers and Forest Owners, Miljöringen rf, Central Organisation of Finnish Trade Unions, Finnish Association for Nature Conservation, Federation of Finnish Enterprises, Central Union of Swedish-speaking Agricultural Producers in Finland, Finnish Confederation of Salaried Employees, WWF, Fingrid Oyj, Posiva Ltd and Advisory Committee on Nuclear Energy.

Comments were not received from the following organisations: Ministry of Social Affairs and Health, Ministry for Foreign Affairs, Western Finland Environmental Permit Authority, Finnish Environment Institute, Municipality of Lapinjärvi, Municipality of Pernaja, Greenpeace, Loviisan puolesta ry, Central Union of Swedish-speaking Agricultural Producers in Finland and Finnish Confederation of Salaried Employees.

Opinions were invited through publishing a notice and organising a public meeting.

In the assessment procedure with respect to cross-border environmental impacts, the Ministry of the Environment notified the authorities of the following countries: Swedish Environmental Protection Agency (Sweden), Ministry of the Environment (Denmark), Ministry of the Environment (Norway), Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Germany), Ministry of the Environment (Poland), Ministry of the Environment (Lithuania), Ministry of the Environment (Latvia), Ministry of the Environment (Estonia) and Ministry of Natural Resources (Russia).

Sweden, Norway, Germany and Estonia participate in the EIA procedure and have commented on the EIA programme. Poland and Lithuania participate in the EIA procedure but have not commented on the EIA programme. Russia will participate in the EIA procedure but has not commented on the EIA programme; Russia will submit its comment at a later date, and this comment will be delivered to the responsible organisation. Latvia and Denmark have replied to the Ministry of the Environment that they will not participate in the EIA procedure. If any of the potential participants in the cross-border procedure submit a comment, it will be delivered to the organisation responsible for the project.

### 3.1 Comments

*Ministry of the Environment*

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According to the statement submitted by the Ministry of the Environment, the assessment programme generally describes matters laid down in Section 9 of the Government Decree on the environmental assessment procedure (713/2006). However, the Ministry considers the programme to be a general description and deficient in parts.

In the summary of its statement, the Ministry of the Environment advises that the EIA report on the planned nuclear power plant should provide further details of the following matters in particular:

- Main alternatives to the project with sub-alternatives and, in conjunction with the zero option, opportunities to increase the efficiency of power consumption
- The nuclear safety of the project and the project's impact on the current arrangements for nuclear waste management at Loviisa
- Limitations of the project and any associated projects, such as fuel procurement, power transmission, demand for back-up power and water supply
- Impacts of cooling water on the state of the sea

The Ministry draws attention to the participation opportunities.

Finally, the Ministry of the Environment stresses the importance of making both the EIA report and the contact authority's respective statement available, when comments will be invited on a potential decision-in-principle.

### *Ministry of the Interior*

The Ministry of the Interior states that an assessment of the potential impact on rescue services should be included, stressing the importance of cooperation between local rescue services and any related parties, and the organisations implementing the programme. In addition, the programme should assess the impact of emergencies on the power production capacity.

The Ministry of the Interior finds the assessment programme comprehensive.

### *Ministry of Defence*

The Ministry of Defence proposes the following issues to be taken into consideration in the impact assessment: serious disruptions mentioned in the targets for the security of supply; protection plans for the nuclear power plant and critical infrastructure in all situations; performance of the economy and infrastructure and security of the energy supply; threat models.

In analysing the alternatives, methods of importing power and the consequent impacts on Finland should be taken into consideration.

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The Ministry of Defence finds the assessment programme appropriate.

***The Ministry of Finance***

The Ministry of Finance finds no cause to criticise the content of the assessment programme.

The Ministry draws attention to the social significance of the project, and to implementing an assessment of economic, social and environmental impacts from the perspective of society in general during the decision-in-principal stage. The Ministry points out that the project planner is not able to assess how demand for electricity could be met if the nuclear plant unit is not built.

***Ministry of Transport and Communications***

The Ministry of Transport and Communications considers the impact assessment insufficient, in that it includes scenarios for local transport only, should the nuclear plant unit receive a construction licence. Therefore, the Ministry proposes expanding the assessment by extending the area under review and taking into account the experiences accumulated from the building of the current nuclear facilities. The need for transport during the construction phase and the opportunities to switch from road transport to alternative transport methods should also be subjected to assessment.

***Ministry of Labour***

The Ministry of Labour finds that the EIA programme introduces the assessment appropriately and maintains that it is vital to provide a detailed assessment of the project's impact on employment, during both the construction and operational stages. A potential estimate of the availability of skilled labour may prove significant to the organisation implementing the project, since insufficient workforce may have an effect on the implementation schedule.

The Ministry finds it important to not only assess the environmental impact of exceptional and emergency situations but to also include the perspectives of employment law and occupational health and safety in the assessment.

The Ministry further notes that, although the organisation implementing the project is not required to provide an impact assessment on improving energy efficiency and conservation at this stage, these will be assessed later by the Government, Parliament and other parties during the potential licensing of the project. The long-term strategy for the climate and energy policy, currently under preparation by the ministerial working group, will have an effect on the wide-scale social assessment of the project.

***Ministry of Agriculture and Forestry***

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The Ministry of Agriculture and Forestry suggests that the EIA programme include the assessment of threats posed by changes and rise in the sea water levels because these have an impact on the reliability and safety of the nuclear power plant. The Ministry further suggests providing additional information on the environmental impact of cooling waters and sewage, with a particular emphasis on the fishing industry and monitoring of the impacts. Impacts on agriculture, food production and household water supply should also be assessed.

The Ministry further proposes some enhancements to the assessment methods.

#### *State Provincial Office of Southern Finland*

Due to the long operating life of the nuclear facility, the State Provincial Office of Southern Finland suggests that the description of land use and the related plans be further specified in the assessment report to include operations in the emergency planning zone and potential limitations of land use. The Provincial Office further proposes enhancing the assessment of health and social impacts in the following areas: risks to the use of household and swimming water during construction and operation, and impacts of traffic dust and noise during the construction phase.

The Provincial Office proposes taking into account the following aspects in order to ensure safety and uninterrupted operation: the experiences accumulated from the building and operation of the current nuclear facilities, partnerships and existing projects in the field of safety, and research initiatives. The assessment report should describe potential emergency situations during construction and how to prepare for them.

The Provincial Office points out the need to facilitate a sufficient number of discussion and feedback events during the assessment procedure, taking into consideration the most sensitive population groups, including disabled persons, in order to ensure equal opportunities for participation.

#### *The Regional Council of Itä-Uusimaa*

The Regional Council of Itä-Uusimaa finds the EIA programme fairly comprehensive and illustrating a broad range of issues. In the Council's view, the role of municipal partnerships should be stressed in the impact assessment of regional structures, economy and employment.

The Council proposes that the intake and drainage sites of cooling waters be specified and subjected to impact assessment, including an assessment of any potential the opportunities to use thermal energy of cooling water.

#### *Eastern Uusimaa Fire and Rescue Services*

The Eastern Uusimaa Fire and Rescue Services finds the EIA programme comprehensive and broad-ranging, and that it incorporates issues discussed

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in the project monitoring group meetings. The Fire and Rescue Services point out that, in order to limit risk, the nuclear power industry has developed a systematic approach to safety, with the objective of preventing and limiting the consequences of emergencies.

However, the Fire and Rescue Services propose enhancements to the emergency planning procedures. These should be taken into account in the environmental assessment of the project phases and a possible major disaster. In defining the affected areas, the protection zone and the emergency planning zone should be taken into consideration and their adequacy reviewed, even though these zones are subject to strict guidelines and definitions. Risk analysis and estimates should be applied to safety assessments.

### ***The Radiation and Nuclear Safety Authority (STUK)***

The Radiation and Nuclear Safety Authority (STUK) maintains that the EIA report should describe the key grounds and objectives for planning the limitation of emissions of radioactive substances and environmental impacts, alongside an assessment of the feasibility of meeting the safety requirements in force.

The EIA programme describes guidelines for analysing the environmental impacts of possible radioactive emissions in emergency situations. The EIA report should include a clear summary of the basis for such an analysis.

In comparison with the EIA programme, the selection of cooling water intake and discharge sites should be accounted for and described more precisely in the EIA report. A comprehensive dispersion calculation for waterways should also cover the seasons and a range of weather conditions.

STUK also points out that, in addition to the habitation mentioned in section 6.3, temporary residents live in the accommodation village.

### ***Safety Technology Authority***

The Safety Technology Authority proposes that the assessment report include a review of risks associated with construction and operation, including the gravity and likelihood of possible emergencies at the plant.

The Safety Technology Authority has no comments to make on the EIA programme.

### ***Uusimaa T&E Centre***

Uusimaa T&E Centre has no comments to make on the EIA programme.

### ***Occupational Safety and Health Inspectorate of Uusimaa***

The Occupational Safety and Health Inspectorate of Uusimaa finds the EIA programme comprehensive.

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*Uusimaa Regional Environment Centre*

Uusimaa Regional Environment Centre proposes changing the project description in order to illustrate more clearly the large scope of the project in comparison to the present nuclear facilities. The impact assessment should be supplemented with an assessment of the combined effects of the planned nuclear plant unit and the existing units. This should include the impact on health of an increased radiation dose and other risks. The report should present the number of permanent habitation and summer residents.

The Environment Centre stresses the importance of carefully assessing the impact of cooling waters. Alternatives to, and combinations of, intake and drainage sites should be assessed in order to illustrate their differences. Alternative intake sites should differ with regard to intake water temperature. Changes in the cooling water intake and drainage arrangements in the present plants must be assessed. The third nuclear plant unit requires draining the cooling waters sufficiently far away from the shore. This option must be included in the alternatives. The effects on waterways are the starting point in the impact assessment of the Natura area.

The Environment Centre finds the description of assessment methods very general. When assessing the impact of cooling waters, the model calculation should be sufficiently precise, accounting for the dispersion of cooling water and describing the impacts with reference to the actual conditions.

The Environment Centre finds the structure of the assessment programme clear and its contents illustrative.

*City of Loviisa*

The City of Loviisa proposes the following additions to the impact assessment of waterways: The effects of the thermal load of cooling water on aquatic plants in the affected area must be assessed, since accelerated growth has been observed, based on the results of waterway monitoring and other sources of information. The impacts of water intake and drainage sites and underwater structures on the undersea physical environment should be studied. Underwater structures may affect currents, fish stocks and other natural environments, during both construction and operation. The environmental impact assessment should be expanded in the sea areas.

The City of Loviisa further proposes adding the following points to the impact assessment programme: impacts of the new road connection – Atomitie-highway 7 – on the environment, forestry and habitation, and impacts of the project on real estate, fire and rescue services and civil defence.

The City of Loviisa states that the assessment programme has been drawn up in mutual understanding with the City, with broad-ranging citizen participation, information provision and opportunities to influence the process.

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***Municipality of Liljendal***

The Municipality of Liljendal finds assessing the social impacts during construction and reducing any negative effects important. Other issues include alternatives to cooling water intake, opportunities to utilise thermal energy, open communication during the EIA process, and protection zones. Liljendal finds the EIA programme comprehensive.

***Municipality of Pyhtää***

The Municipality of Pyhtää has no comments to make on the EIA programme.

***Municipality of Ruotsinpyhtää***

The Municipality of Ruotsinpyhtää stresses the importance of assessing the impact of the plant's waste heat on sea water, and Lappomträsket. Ruotsinpyhtää points out that the assessment will be made in partnership with local operators.

**AKAVA**

The Confederation of Unions for Professional and Managerial Staff in Finland (AKAVA) presents the organisation's general energy and climate policies, and AKAVA's member organisations point out the social significance of nuclear power as part of these policies.

AKAVA proposes that the reviewed options include the utilisation and profitability of condensation heat (The Finnish Medical Association) as well as energy conservation (The Finnish Union of Environmental Professionals).

In the main, the assessment is considered appropriate and comprehensive. AKAVA proposes providing additional information with regard to the impact assessment as follows: Although the safe final disposal of nuclear waste is a key question in the nuclear power industry, the utilisation of waste may present a future option for energy production (The Finnish Medical Association). Unexpected emergencies and exceptional situations should include changes in the environment, threats caused by human activities and securing basic energy production in unexpected situations. It should be determined which factors with a detrimental effect on the environment should be excluded from the zero option (The Finnish Union of Environmental Professionals).

***Confederation of Finnish Industries EK***

The Confederation of Finnish Industries EK finds the assessment programme comprehensive.

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***Finnish Energy Industries***

Finnish Energy Industries considers the EIA programme comprehensive, and also notes the project's social significance.

***Central Union of Agricultural Producers and Forest Owners***

The Central Union of Agricultural Producers and Forest Owners finds communication and interaction important, maintaining that the communication and participation plan presented in the EIA programme provides a solid base for interaction. Residents, land owners, stakeholder groups and other potentially affected groups in the area should be heard and their views taken into account.

The Union suggests that attention should be paid to the indirect effects of the project, such as the planned power transmission structures. The Union also remarks on the project's social significance and the need to review questions relating to the energy policy in the decision making process.

***Miljöringen rf***

Miljöringen proposes including in the assessment the following issues: water use, utilisation of thermal energy, use of chemicals in the processes, and air pollutants, such as emissions from the diesel aggregates and gas turbines. The Association hopes that a review of energy-saving opportunities in the plant will be included.

***Central Organisation of Finnish Trade Unions***

The Central Organisation of Finnish Trade Unions considers uninterrupted operation and safety in all circumstances to be the key point of the assessment. The assessment should take into account the experiences accumulated from the fifth nuclear power plant, the latest international data on the safety of nuclear power plants and STUK's views as a whole.

In terms of interactivity, the Association finds it important that the trade union representatives, at all levels of staff, be informed of the projects, with a particular view to keeping the representatives of the Finnish Electrical Workers' Union and Loviisa's local professional association up to date on the project's progress.

All in all, the Organisation finds the assessment programme sufficient.

***Finnish Association for Nature Conservation***

The Finnish Association for Nature Conservation maintains that the need for the project should be justified to a sufficient extent. Energy conservation and renewable sources of energy should be reviewed as options.

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The Association maintains that the impact assessment should be enhanced by considering the entire life cycle of the project, including the environmental impact of processing and transporting uranium, the decommissioning of facilities, nuclear waste management and transport. Combined effects should be reviewed in addition to the environmental impact of the project, including the effects of the current units. Environmental changes, which may have an effect on the project, should also be considered.

The Association also suggests providing more detailed information on the assessment of environmental impacts, such as the areas of impact, the affected area and the effects of emergencies.

### *Federation of Finnish Enterprises*

The Federation of Finnish Enterprises states that the EIA programme has been appropriately drawn up, covering all key aspects of assessment to a sufficient extent.

The Federation would find it reasonable to review a zero option, in which emissions of different power production methods are assessed. This would provide an estimate of the realistic alternatives to the power plant.

### *WWF*

WWF suggests that the EIA programme should give equal weight to different options which can satisfy the need for, and objectives of, the project. These options should particularly include an increase in energy efficiency and the use of renewable sources of energy. The assessment should mention how different views, such as those of citizens and organisations, have been considered when the options were formed.

WWF maintains that the impact assessment should be enhanced by considering the entire life cycle of the project, including the environmental impact of processing and transporting uranium. The environmental impact of construction should be assessed with regard to using natural resources and creating emissions.

WWF also suggests providing more detailed information on the assessment of environmental impacts, such as on the Natura area and on people, the affected area and the effects of emergencies. WWF notes that up-to-date data should be used in the assessment.

### *Fingrid Oyj*

Fingrid has investigated the possibilities of connecting the Loviisa 3 unit to the national grid and the necessary reinforcement of the grid on the basis of data on the nuclear power plant. The necessary reinforcements of the grid are included in the long-term development plan of the national grid and also form part of the preparations for a provincial plan. Fingrid has commenced

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its investigations for establishing power line routes. The environmental impacts of these changes will be assessed in separate EIA procedures.

### *Posiva Oy*

Posiva finds no cause to criticise the EIA programme.

### *Advisory Committee on Nuclear Energy*

The Advisory Committee on Nuclear Energy finds the extent of the EIA programme adequate. After the assessments described in the programme have been completed, sufficient basic data will be available for making the decision-in-principle.

However, the Committee finds it critical that the assessment should take into account changes in the operational environment to an appropriate degree. For example, the ICRP's new guidelines on radiological protection, currently at the drafting stage, should be taken into consideration wherever possible, since they involve an assessment of radiation doses affecting both human and other populations. Since considering the impact of climate change is vital, the EIA report should provide a description of methods for preparing for and adapting to climate change.

### *Sweden: Naturvårdsverket*

Sweden's environmental authority, Naturvårdsverket, considers the EIA programme sufficient on the whole. The main impacts will be on the sea, and data on these is gathered under the environmental monitoring programmes of the current facilities. The EIA programme is also considered appropriate by Sweden's nuclear safety authority, Statens Kärnkraftinspektion. It finds the impact assessment of the normal use of the power plant particularly comprehensive.

Comments invited by the Swedish environmental authority emphasise the assessment of radioactive emissions from several perspectives. Particular attention should be paid to the potential long-range transportation of radioactive emissions and the related preparations, technologies to reduce emissions and mitigating the potential harmful effects. The impact of emissions on the environment and industries should be assessed, e.g. fish stocks and fishing. The authority notes that it would be prudent to assess the combined impacts of the planned unit and the current units on the radioactivity of the Baltic Sea.

It suggests that the impact assessment could be enhanced by examining the whole life cycle of the project and assessing the environmental effects resulting from the production of nuclear fuel and spent nuclear fuel.

The comments draw attention to the lack of, or insufficient exploration of, a zero option, with particular mention of the lack of alternative means of power production.

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***Norway: Ministry of the Environment***

In Norway, the Ministry of the Environment acts as the environmental authority. It emphasises the assessment of reactor safety, emergency situations, unexpected events and radioactive emissions. The Ministry also suggests that it would be prudent to describe the plans and monitoring systems for emergencies and exceptional situations.

Comments invited by the Norwegian environmental authority also emphasise the assessment of radioactive emissions from several perspectives. Particular attention should be paid to the potential long-range transportation of radioactive emissions and the related preparations, and mitigating the potential harmful effects. The impact of emissions on the environment and industries should be assessed, e.g. the impact on vegetation, animals, reindeer husbandry and recreational use. Nuclear waste management and alternatives are also mentioned in the statement.

***Germany: Innenministerium Mecklenburg-Vorpommern***

Innenministerium Mecklenburg-Vorpommern in Germany proposes taking into consideration the long-range transport of air- and waterborne pollutants in the assessment of radioactive emissions, including an impact assessment of long-term transport, and a description of how Germany, among other countries, will be informed in case of emergency. The Ministry suggests that the impact assessment should be enhanced by examining the environmental effects of the production of nuclear fuel and management of spent nuclear fuel.

***Estonia: Ministry of the Environment***

Acting as the environmental authority, the Estonian Ministry of the Environment stresses the description of cross-border emergencies from several perspectives. The description should identify any impacts requiring protection from radiation and the methods of informing neighbouring countries in emergencies.

The Ministry further suggests that alternative methods of power production be included in the assessment.

**3.2 Other comments and opinions**

A total of nine other comments or views were submitted. Six of these were from organisations and three from private persons. In addition, the responsible organisation delivered 11 written comments, which had been presented in public meetings, marketplace events or other occasions.

The following organisations presented a comment or opinion: The Edelleen ei ydinvoimaa popular movement against nuclear energy, Women Against Nuclear Power, Women for Peace in Finland and Amandamij (joint com-

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ment), the Réseau Sortir du Nucléaire network, and the Finnish Youth for Nuclear Energy.

Several comments suggest that the environmental impact assessment should be enhanced by considering the entire life cycle of the project, including the environmental impact of processing and transporting uranium, the decommissioning of facilities, nuclear waste management and transport. Other suggestions for supplementing the project concern the public roads and power lines.

The impacts of cooling waters should be assessed across a wide area, taking into consideration the experiences of local professional fishermen. The combined effects of the present plants and the third unit should also be accounted for in the impact assessment.

In the human impact assessment, habitation and the attractiveness of the living environment should be taken into consideration, including impact on the Swedish-language culture, negative social impacts and potential impacts on the use of holiday homes.

Furthermore, the assessment should take into account climate change and other threats to the project, including the likelihood of emergencies due to these threats.

The comments also mention the project's social significance and address the need to assess other alternative means of energy production. Several opinions do not present views relating to the EIA programme in addition to the aforementioned comments but either oppose or support the use of nuclear energy in general.

#### **4 Contact authority's statement**

The Ministry of Trade and Industry states that the EIA programme for the Loviisa 3 nuclear power plant unit meets the content requirements of EIA legislation and has been handled in the manner required by the legislation. The comments submitted consider the programme to be appropriate, in the main, and quite comprehensive.

However, attention should be paid to the following issues in the investigations and the drafting of the EIA report. The organisation responsible for the project should also account for the additional questions, notes and views presented in the comments and opinions, answering as many of them as possible in the EIA report.

#### **4.1 Project description and the alternatives**

The EIA programme presents a summary of the power range and potential types of the planned nuclear power plant, including the operational principles of the boiling water reactor and the pressurised water reactor. The Radiation and Nuclear Safety Authority (STUK) maintains that the EIA report

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should prescribe the key grounds and objectives for planning 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.

In the Ministry's view, the EIA report should include a review of current nuclear power plant types on the market which are suitable for the project under review. Similarly, the safety planning criteria for the prospective plant must be presented with respect to 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 suggests that, for the purposes of communicating the project, it may prove advantageous to include a short description of the cost structure of the project and its alternatives in the EIA report.

A situation in which the Loviisa 3 project would not be implemented is regarded as a zero option in the EIA programme. The responsible organisation would not build another type of power plant on the Loviisa plot instead of the new nuclear power plant unit; instead, the area would remain unused for the time being. This means assessing the environmental impact of a situation where the amount of electricity corresponding to the unit's production capacity would be bought from the market. Energy conservation will not be assessed as an alternative, since the organisation responsible for the project does not have access to any energy conservation means that would allow the replacement of the quantity of electricity that would be produced by the proposed nuclear power plant.

Several comments suggest that the EIA programme be supplemented with an assessment of alternative solutions, such as energy conservation and efficiency.

The Ministry points out that the organisation responsible for the project is a company that sells electricity. Therefore, it cannot access any significant means of energy conservation or operational efficiency and has limited opportunities to influence the electricity use of its customers. The Ministry also notes that the report on the importance of a new nuclear power plant or power plants to the national energy supply, supporting the Government's decision-making with regard to reaching the decision-in-principle, will include information on energy conservation and efficiency. However, this perspective will cover the Finnish energy supply as a whole and thus could not be applied to the issue of replacing the power plant under review. Drawing up nationwide reviews of energy supply falls within the remit of the central government. The Ministry points out that the Government is currently preparing a long-term climate and energy strategy.

The Ministry recommends that the EIA report introduce the energy efficiency and conservation efforts undertaken by the responsible organisation.

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## 4.2 Impacts and the assessment

In the EIA programme, the impact of cooling and sewage water on water quality, biology, fish stocks and the fishing industry are assessed on the basis of existing studies and the results of dispersion model calculations of cooling water. The review covers cooling waters both from the present and new power plants. The calculations cover an area of approximately 150 square kilometres, focusing on the sea area west of the power plant. The EIA programme states that the plans for the water supply in the new power plant will be drawn up with the local operators.

Several comments stress the significant impact of cooling water on the state of the marine environment around the power plant, suggesting that the assessment be extended to cover a wider area. The effects of warming sea water should be included in the assessment, and the impact on the fishing industry, among others, is mentioned in several comments. The comments remark on the environmental assessment of other means and alternative arrangements for the water supply.

The Ministry is of the view that the impacts of cooling waters form the most significant environmental impact during normal plant operation. The selection of cooling water intake and discharge sites should be accounted for and described precisely. When analysing the environmental impacts of sea water warming, any background material available must be utilised extensively and the analyses must be linked on a wider scale to the state of sea areas. In order to define the affected area, the analyses must be extended to cover a wide sea area and must take into consideration the thermal stress caused by the present Loviisa power plant units. The impact of cooling waters on protected areas must be assessed, including an assessment of the need to conduct a Natura review pursuant to Section 65 of the Nature Conservation Act. The EIA report must introduce measures to reduce adverse effects. Uncertainties in calculation results must be illustrated clearly. The assessment of the arrangements for water supply must be supplemented by including alternative options and assessing their environmental impacts.

According to the EIA programme, in order to assess the impacts of related projects, the impact of the 110 kV connecting power lines, to be constructed alongside the present power lines, will be included in the assessment. The comments remark on the importance of assessing the impact of power lines. A new nuclear unit would require improved power transmission. Fingrid Oyj has investigated the possibilities of connecting the Loviisa 3 unit to the national grid with a 400 kV connection and the necessary reinforcement of the grid on the basis of data on the nuclear power plant. Fingrid has commenced its investigations for establishing power line routes. The environmental impacts of these changes will be assessed in separate EIA procedures. In the Ministry's view, the responsible organisation must extend the review of the environmental impacts of the 110 kV transmission connection up until the next switching substation.

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According to the EIA programme, in order to assess the impacts of related projects, the impact of growth in traffic volumes will be included in the assessment. The comments remark on the importance of assessing the impact on public roads and extending the affected area to be observed. The Ministry finds assessing growth in the volume of traffic a good starting point and requires that the impacts on nature and other environments are assessed, particularly on a local level, covering a wider area wherever possible.

According to the EIA programme, the organisation responsible for the project will examine the environmental impacts of nuclear fuel production and transport and clarify the possible sources of uranium, including enrichment and manufacturing. Some comments point out that the environmental impacts of the entire production chain of nuclear fuel should be considered as environmental impacts of the project. The Ministry finds it reasonable that the organisation responsible for the project should examine the environmental impacts of the entire fuel supply chain in general and, additionally, the company's opportunities to influence this chain. The Ministry requires a description of the assessment method, such as a method to assess the use of existing studies and the use of public information, to be published.

According to the EIA programme, the EIA report will describe the quantity, quality and treatment of municipal and hazardous waste, low and intermediate level radioactive waste, and decommissioning waste generated at the plant unit, and will assess the related environmental impacts. The environmental impacts of the disposal of spent nuclear fuel are described using the results of the EIA procedure carried out by Posiva Oy in 1999 and the studies carried out thereafter. In the comments, grounds are presented for assessing the environmental impact of nuclear waste management using the latest data. The Ministry finds the plan proposed by the organisation responsible for the project to be appropriate, and points out that the latest available data must be quoted in the assessment. The Ministry also maintains that the EIA report should review nuclear waste management as a whole, including extensions to the necessary storage and final disposal facilities and their environmental impacts.

According to the EIA programme, the assessment includes the environmental impacts of exceptional circumstances and, among other factors, of climate change. Several comments remark on the impact assessment of exceptional circumstances and emergencies. The Ministry is of the view that the EIA report must present various emergency scenarios involving radioactive emissions and, with the help of illustrative examples, should describe the extent of the affected zones and the impacts of emissions on people and the environment. The assessment may use the classification system of the International Atomic Energy Agency (IAEA), and the EIA report must present a clear summary of the basis used in the review. Assessing the impacts must not be limited to the exclusion area or the emergency planning zone for rescue operations. 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. The Ministry finds it appropriate that the as-

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assessment of exceptional circumstances take into consideration, among other factors, the effects of climate change. The Ministry requires that the assessment include a review of preparations to cope with climate change and that special attention be paid to changes in sea level.

According to the EIA programme, the impacts of alternative solutions will be examined with regard to human health, the attractiveness of the living environment and living conditions, while the impacts of construction and operation will be examined with regard to regional structure, economy and employment. Among other factors, the impact on employment and real estate values is found to be important in the comments. The Ministry proposes providing a detailed assessment of the project's impact on employment, during both construction and operational stages. In addition, the project's impact on the current use and value of real estate and methods of mitigating possible adverse effects must be examined.

The EIA programme introduces several different methods to assess various environmental impacts. For example, impacts on people and society will be assessed by calculations of radiation doses, noise testing, surveys among the residents, and separate reviews of the regional economy. Some comments propose adding to or further defining the assessment methods, particularly with regard to the impacts of cooling waters and emergencies, further assessing the areas of impact, and incorporating the ICRP's new guidelines on radiological protection, published in October 2007. The Ministry requires the responsible organisation to include the suggestions in the assessment methods wherever possible.

#### **4.3 Plans for the assessment procedure and participation**

The MTI considers that the arrangements for participation during the EIA procedure can be made according to the plan presented in the EIA programme. However, sufficient attention should be paid in communications to, and interaction with, the entire affected area of the project, across municipal borders and all population groups. The Ministry requests that the parties consider ways of presenting the impact of participation in the EIA report.

When the EIA report is finalised, the MTI will publish a public notice, make the report available, and invite various authorities and possible other parties to comment on the report. The statement on the EIA report, prepared by the MTI in its capacity as a contact authority, will be delivered to the municipalities in the affected area and to the appropriate authorities.

#### **4.4 Assessment report**

Pursuant to the Nuclear Energy Act, submitting an application to the Government for a decision-in-principle is possible before the contact authority has published a statement on the EIA report. However, pursuant to the EIA Act, the EIA procedure will not be completed until the contact authority has issued a statement on the EIA report and delivered the project-related com-

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ments and opinions on the EIA report to the organisation responsible for the project.

In its comment, the Ministry of the Environment stresses that when comments are invited on a prospective decision-in-principle, both the EIA report and the contact authority's respective statement must be made available.

The MTI does not consider it appropriate that an EIA report and an application for a decision-in-principle be presented for comments at the same time, since they relate to the same project. The Ministry hopes that the contact authority is able to submit the EIA report for comments and provide the contact authority's statement before the application for a decision-in-principle is presented to the Government.

## 5 COMMUNICATING THE STATEMENT

The MTI will deliver the EIA statement to those authorities that have submitted comments. The statement will also be available on the Internet at [www.ktm.fi](http://www.ktm.fi)

The Ministry will send copies of the comments and opinions concerning the assessment programme to the organisation responsible for the project.

The original documents will be stored in the Ministry's archives.

Minister of Trade and Industry

Mauri Pekkarinen

Counsellor

Jaana Avolahti

NOTICE

Authorities that have submitted comments  
Finnish Environment Institute