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Teollisuuden Voima Oyj  
Olkiluoto  
FI-27160 EURAJOKI

## **ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE OLKILUOTO 4 NUCLEAR POWER PLANT UNIT; STATEMENT BY THE CONTACT AUTHORITY**

On 14 February 2008, Teollisuuden Voima Oyj (hereinafter, TVO) submitted an environmental impact assessment report (EIA report) to the Ministry of Employment and the Economy (MEE) in accordance with the environmental assessment procedure (EIA procedure), pursuant to the Environmental Impact Assessment Act (468/1994; EIA Act), on the project concerning the fourth unit of the Olkiluoto nuclear power plant.

### **1 Project information and EIA procedure**

#### 1.1 Organisation responsible for the project and the contact authority

The organisation responsible for the project is TVO, which holds the operating licences for the two present units in the Olkiluoto nuclear power plant, valid until the end of 2018. In addition, TVO is currently constructing the Olkiluoto 3 nuclear power plant unit, for which the Government issued a construction licence in 2005, and which, according to information received from the project contractor, TVO estimates to be completed in 2011.

TVO's primary consultant in the environmental impact assessment procedure has been Pöyry Energy Oy.

Pursuant to the EIA Act, the Ministry of Employment and the Economy is acting as the contact authority in the EIA procedure. In the early stages of the procedure, the Ministry of Trade and Industry acted as the contact authority, but the Ministry of Employment and the Economy took over the task as of 1 January 2008.

#### 1.2 The project and its alternatives

TVO is exploring the opportunities to expand its nuclear power plant, located on the island of Olkiluoto in the municipality of Eurajoki, with a fourth plant unit. The purpose of the project is to increase power

production capacity, both to satisfy increasing demand and to replace capacity about to be withdrawn from the market.

The electrical output of the planned unit would 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 Olkiluoto 4 unit is designed as a base-load power station and, excluding the annual service shutdown, it would run continuously throughout the year, having an estimated technical life cycle of approximately 60 years.

The project includes the interim onsite storage of spent nuclear fuel generated by the new unit, and the treatment and disposal of low and intermediate level radioactive operating waste. In addition, the implementation of power transmission to the national grid is included in the project.

A situation in which the Olkiluoto 4 project would not be implemented is regarded as a zero option. TVO would not consider building another type of power plant in the Olkiluoto plot instead of the proposed nuclear power plant unit, and the area would remain unused for the time being. The zero option assesses the impact caused by generating the electricity corresponding to the plant unit's production using the average Nordic power production structure.

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

Construction of the power plant unit would take six to eight years, as planned by TVO. On 25 April 2008, TVO submitted to the Government an application for a decision-in-principle on the Olkiluoto 4 plant project.

### 1.3 Nuclear power plant licensing procedures

Pursuant to the Nuclear Energy Act, the decision-making and licensing system is based on a principle of continuous safety reviews, and specification of assessments throughout the procedure so that the final safety assessments will only be made at the operating licensing stage.

The Nuclear Energy Act presents the licensing procedure of a nuclear power plant. Decision-making and the licensing system are based on a number of principles, including the continuous reviewing of safety, and the specification of assessments throughout the lifecycle of any nuclear power plant.

Furthermore, a significant number of other licences are 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 by the local municipality. All planning of the prospective nuclear power plant must be completed prior to applying for the building permit and construction licence.

### 1.3.1 Environmental impact assessment

The EIA procedure constitutes part of the safety and environmental impact assessment for nuclear power plants laid down in a decision-in-principle under the Nuclear Energy Act (NEA 990/1987). However, it does not form part of the actual licencing process of a nuclear power plant unit.

The EIA procedure is implemented in two stages: initially, the party responsible for the project compiles a plan on environmental impact assessment, i.e. the EIA programme, and on the basis of statements and opinions presented on the programme, the contact authority finally gives its statement.

Thereafter, the party responsible for the project prepares an assessment programme, and on the basis of the contact authority's statement and various reports, the environmental impact assessment report.

During the second hearing, the Ministry of Employment and the Economy will invite several ministries, authorities and communities to submit their opinions on the EIA report. The general public can participate in this hearing, and also in the hearing at the programme stage. On the basis of the EIA reports and comments given, the Ministry will prepare its final statement to conclude the EIA procedure, which typically takes at least one year in the case of nuclear power plant projects.

### 1.3.2 Decision-in-principle

The prospective nuclear power plant complies with the definition of a nuclear 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 (NED 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, which means that for example the thermal power cannot exceed the maximum thermal power given in the EIA procedure.

The processing of the application for the decision-in-principle is not solely based on the material provided by the applicant, because the authorities will acquire supplementary reports, both those required under 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 MEE will obtain a statement from the municipal council of the local authority where the site of the power plant is proposed, 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 Ministry must obtain a preliminary safety assessment for the project from the Radiation and Nuclear Safety Authority (STUK).

Pursuant to section 24(h) of the Nuclear Energy Decree, the application for a decision-in-principle shall include an overview of the applicant's plans and available methods for arranging nuclear waste management. The submission of plans based on binding agreements involving matters such as the nuclear waste management of the nuclear power plant project cannot be expected during the decision-in-principle stage. This rule also applies to fuel supply management (section 24(g) of the Nuclear Energy Decree).

The MEE 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. This is partly based on the overview of the plant project, publicised by the applicant, the environmental impact assessment of the plant, and its safety. Therefore, the report must be made generally available, and in the municipality where the planned site of the facility is located, it will be distributed to all households (NEA, section 13).

The Ministry will also arrange a public meeting, where the general public will have the opportunity to express 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 the nuclear facility is planned to be located is in favour of the facility, and ensure that no facts indicating a lack of sufficient prerequisites for constructing and using a nuclear facility in a safe manner and not causing injury to people, or damage to the environment or property, have arisen in the statement from the Radiation and Nuclear Safety Authority (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.

### 1.3.3 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, prerequisites for granting the construction licence include 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.

Any decision regarding the construction licence shall describe how the EIA report and the related statement by the contact authorities have been applied (section 13 of the EIA Act).

In connection with the construction licence application, checks will be made to ensure that a site has been reserved for construction in the town plan and that the applicant has possession of the site, as required for the operation of the plant (section 19(4) of the Nuclear Energy Act). Therefore, the planning process must be finalised by this stage (cf.

section 9 of the EIA Act). However, the information and reports produced by the EIA procedure can be used in the planning process.

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

#### 1.3.4 Licence to operate

The operation of a nuclear power plant requires an operating licence issued by the Government. In order to receive such 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 the municipalities, authorities and citizens concerned will be arranged during the application process for the operating licence.

#### 1.3.5 Other required licences

Activities causing the risk of environmental pollution require a permit in compliance with the Environmental Protection Act. In this case, the thermal load caused by the cooling water of a condensing power plant is the most significant impact to be assessed. The activities are subject to licence on the basis of the Environmental Protection Act (86/2000) and the Environmental Protection Decree (169/2000) issued on the basis of the aforementioned Act. The environmental permit covers all issues pertaining to environmental impact, such as emissions to air and water, waste management (excluding nuclear waste), noise abatement and any other related issues. Separate environmental permits are required for operations during the construction stage, and a building permit granted by the local municipality is required for the actual construction.

The licensing authority for this project is the Western Finland Environmental Permit Authority. The EIA procedure must be completed before any permits can be granted.

Extraction of water from water bodies, related to the operation of a power plant, is subject to permission under the Water Act (264/1961). The Western Finland Environmental Permit Authority is the licensing authority for this permit.

Other technical permits related to environmental impact include permits for inflammable liquids and pressurised containers, and permits under the Chemicals Act.

## 2 Communication pertaining to the assessment report, and hearing

A public notice about the EIA report was published on 19 and 20 February 2008 in the following newspapers: *Helsingin Sanomat*, *Hufvudstadsbladet*, *Turun Sanomat*, *Satakunnan Kansa*, *Uusi Rauma* and *Länsi-Suomi*. The public notice and the assessment report are available on the MEE website: [www.tem.fi](http://www.tem.fi)

Members of the public were able to view the assessment report between 19 February and 21 April 2008 in the local government offices of Eurajoki, Eura, Kiukainen, Lappi, Luvia and Nakkila and in the environmental office in Rauma. Together with the party responsible for the project, the Ministry organised a public meeting to discuss the project on 11 March 2008 in Eurajoki.

The following organisations were invited to comment on the assessment report:

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 Agriculture and Forestry, Ministry for Foreign Affairs, State Provincial Office of Western Finland, Satakuntaliitto Regional Council, Western Finland Environmental Permit Authority, Finnish Environment Institute, Radiation and Nuclear Safety Authority (STUK), Safety Technology Authority (TUKES), Satakunta T&E Centre, South-Western Finland T&E Centre, Occupational Safety and Health Inspectorate of Turku and Pori, Regional Environment Centre of Southwest Finland, Municipality of Eurajoki, Municipality of Eura, Municipality of Kiukainen, Municipality of Lappi, Municipality of Luvia, Municipality of Nakkila, City of Rauma, Satakunta Rescue Service, Confederation of Unions for Professional and Managerial Staff in Finland (AKAVA), Confederation of Finnish Industries EK, Finnish Energy Industries, Greenpeace, Central Union of Agricultural Producers and Forest Owners MTK, Central Organisation of Finnish Trade Unions (SAK), Finnish Association for Nature Conservation, Federation of Finnish Enterprises, Finnish Confederation of Salaried Employees STTK, WWF, Fingrid Oyj and Posiva Ltd.

Comments were not received from the following organisations: Ministry of Defence, Ministry for Foreign Affairs, Ministry of Transport and Communications, Western Finland Environmental Permit Authority, Finnish Environment Institute, Central Union of Agricultural Producers and Forest Owners (MTK), Central Organisation of Finnish Trade Unions (SAK), Finnish Confederation of Salaried Employees (STTK), Confederation of Unions for Professional and Managerial Staff in Finland (AKAVA), Satakunta Rescue Service, WWF and the Municipality of Nakkila.

The Espoo Convention (67/1997) will be applied to the assessment of the project's cross-border environmental impact, whereby the parties to the Espoo Convention have the right to participate in the EIA procedure. The Ministry of the Environment is responsible for the practical arrangements for conducting the international hearing.

In the assessment procedure with respect to cross-border environmental impact, the Ministry of the Environment notified the authorities of the following countries: Naturvårdsverket (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).

After the conclusion of the programme stage, the Federal Ministry of Agriculture, Forestry, Environment and Water Management (Austria) joined the procedure. At the report stage, the Ministry of the Environment requested the authorities of Sweden, Norway, Lithuania, Estonia, Russia and Austria to comment on the EIA report by 28 April 2008.

Sweden, Norway, Estonia, Lithuania and Austria have submitted statements on the EIA report, but the Ministry of the Environment has not received replies from Denmark, Germany, Russia or Poland. If any of the potential participants in the cross-border procedure submit a comment later on, it will be delivered to the organisation responsible for the project.

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

#### **Comments invited by the MEE**

The comment by the *Ministry of the Environment* focuses on how the issues set forth in the statement by the Ministry of the Environment have been taken into account in the EIA procedure. In this context, the Ministry does not comment on the acceptability of the project and its environmental impact, nor on the actual necessity of the project.

In its statement on the EIA programme, the Ministry of the Environment stated that the EIA report shall handle separately at least the most probable reactor options available in the market that can be considered, their environmental impact and differences in terms of nuclear safety. The EIA report does not include a detailed analysis of the variations in different reactor options (plant types and reactor output) as regards nuclear safety and environmental impact. This is a significant defect in the opinion of the Ministry of the Environment.

The report states (chapters 4.1 and 12.2), that the requirements on nuclear safety are practically identical for all plant types, which means that it does not matter which plant type gets chosen. The Ministry of the Environment states that the purpose of the EIA procedure is not to assess the project and its alternatives principally together with alleviating measures, but instead, specifically to separate these issues from one another, revealing the environmental impact of various options openly for comparison.

Furthermore, as regards radioactive emissions, the report states that the

potential plant types do not differ from one another to any significant degree. However, the report does not present the potential plant types which means that the conclusion on the insignificance of the differences cannot be proven. In this respect, the Ministry of the Environment regards the assessment as completely inadequate.

The assessment method used to evaluate nuclear safety is a conservative one, assessing environmental impact by reviewing the highest possible environmental load. Section 12.2 of the report states that the amount of heat leaked to the sea, and the required quantity of cooling water are directly comparable with the output of the plant. The Ministry of the Environment regards such a small-scale review as inadequate.

The zero alternative handled in the EIA report is a situation where the project is not implemented, and TVO's associates are presumed to acquire the amount of power corresponding to the production output of the proposed nuclear power plant unit from the Nordic electricity market. However, at this stage there is no assessment of the opportunities for enhancing or reducing electricity consumption in the Nordic market, as the Ministry of the Environment's statement on the EIA programme proposed. Therefore, the Ministry of the Environment considers the exclusion of this viewpoint from the assessment of the zero alternative as a defect.

The contact authority's statement on the EIA programme recommends that the energy efficiency and conservation measures undertaken by the applicant should be introduced. The report presents this issue very generally, but in this context there would have been grounds to analyse and publicise the energy efficiency level (BAT benchmarking) of TVO's associate companies and the measures taken to improve it for instance over the past five to ten years.

The contact authority's statement requires the EIA report to present 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 report (chapter 10.4) presents the impact of a serious reactor accident in radiation doses at various distances from the power plant, and the measures required in this type of accident to protect the population, and restrictions for consumption of agricultural produce. The description of the accident scenario specification and impact of the accident is difficult to understand. It is vital that the reviews of various accident scenarios and descriptions of accident impact are clear and understandable, because the concerns of the general public over the safety of nuclear power plants are largely linked to their uncertainty over the impact of possible emergencies.

According to section 9 of the EIA decree, the EIA report must include a description of the methods used for the sourcing and assessment of material, and the assumptions and defaults thereof. However, in this EIA report the description of the methods used for radiation dose assessment is too general and is therefore inadequate. Hence, the Ministry of the Environment is of the opinion that the assessment should



be completed in this respect, and the description in the report be more illustrative. Furthermore, the potential impact of a less severe incident must be reviewed in this context.

The new nuclear power plant unit is an undertaking falling within the scope of the Convention on Environmental Impact Assessment in a Transboundary Context of the ECE, the United Nations Economic Commission for Europe. Therefore, the Ministry of the Environment has provided the authorities of neighbouring countries, other Baltic Rim countries and, by request, the authorities of Austria, the possibility to participate in the EIA procedure of the project. Above all, the interest of other states focuses on environmental impact caused by the possible migration of radioactive substances beyond the borders of Finland in case of an accident.

The report does not handle the matter in any other way than in the form of radiation doses, shown in a table, at certain distances from the plant. Generally, it is good that such a review is included but the scope of the assessment is insufficient. The comments sent by other nations to Finland also reflect this deficiency. Moreover, the Ministry of the Environment points out that the transboundary environmental impact should primarily be described in the actual EIA report, not only in the summary document translated into different languages.

The statements of the Ministry of the Environment and the contact authority on the EIA programme pay special attention to the necessity for providing clarification on the need for assessing the Natura-related impact on the Rauma Archipelago area (FI0200073), forming part of the Natura 2000 network, located in the vicinity of the nuclear power plant site. The means testing included in the EIA report (chapter 9.10) on this matter comes to the conclusion that there is no need for actual assessment in compliance with section 65 of the Nature Conservation Act (1096/96). The Ministry of the Environment does not regard this conclusion as justified, considering the descriptions included in the report concerning the extent of the area likely to be affected by cooling waters, and the changes in temperature expected for the Natura 2000 site in question.

The Ministry of the Environment emphasises that on the basis of recent case law concerning Union legislation, the licences, permits or other official decisions required for the project under the Nuclear Energy Act, Land Use and Building Act, or Environmental Protection Act cannot be granted unless the authorities in question have first ensured that the project has no significant adverse effects on the Natura 2000 site. Correspondingly, assessment of impact on the Natura 2000 site must be conducted unless it can objectively be excluded that they would have a significant impact on the area in question. On the basis of facts in section 9.10.3 of the EIA report, it is therefore obvious in the Ministry's opinion that the conclusion must be that a closer assessment is necessary.

Furthermore, the Ministry points out that if a closer impact assessment procedure proves that the impact is significant for some part, the prerequisite for permits required for the project will be that the Government has, in accordance with section 66, subsection 2 of the

Nature Conservation Act, decided that the project must be carried out for imperative reasons of overriding public interest. Therefore, it is essential in consideration pertaining to this decision-making process that the impact assessment has been carried out with particular care so that it points out sufficient facts based on appropriate analyses, e.g. on the lack of alternative solutions, the nature, targeting and quantity of adverse impact, and the possibilities for compensating them.

As regards the EIA programme, the Ministry points out that the habitat types forming the basis for selection of the aforementioned Natura 2000 site must be placed under such monitoring that can later prove the correctness of conclusions made in the impact assessment to be prepared. Therefore, the monitoring procedures of biological status, described in section 14.3.2 under the title 'monitoring of waterways', should be specified.

The report (chapter 8.1) states the intention to close the straits between the island of Kuusisenmaa and Olkiluoto, in order to diminish the impact of the recirculation of the cooling waters and to enhance the efficiency of site monitoring. It should be noted that in the cooling water modelling, the assumption is that the straits have been closed (chapter 9.7.8), but the report does not include a corresponding modelling where the straits would remain in their current status. In the opinion of the Ministry of the Environment, such an option should definitively have been reviewed in the report, which should also have included an assessment of the environmental impact resulting from the closure of the straits, and an account of the permits required for constructing a neck of land. The EIA programme should already have included the plan on closing the straits. The Ministry of the Environment finds these defects highly significant and emphasises that these parts of the report must be completed.

The statements of the Ministry of the Environment and the contact authority on the EIA programme emphasised that the EIA report shall review nuclear waste management as a whole, including extensions to the necessary storage and final disposal facilities and their environmental impact, alongside the impact on the current licensing of nuclear waste management facilities. However, the review is defective in parts.

The planned extension to the power plant's underground waste management facility is described, but a more precise schedule is not included, nor is an assessment of the environmental impact caused by the extension. The extension to the KPA storage facility for spent nuclear fuel is reported to be due in 2011-2014, but no description of the extension plans and eventual environmental impact is included. The validity periods of the current operating licences for the KPA storage facility for spent nuclear fuel and the power plant's VLJ repository (underground waste management facility) are stated but the report does not handle any of the reports and procedures required for renewal of these operating permits. The report does not reveal the fact that the final disposal of spent nuclear fuel from Olkiluoto 4 will require a new decision-in-principle. Therefore, the Ministry of the Environment states that the review of nuclear waste management should be completed as regards the listed defects, and finds that the impact of cooling waters form the most significant environmental impact of a nuclear power plant

during normal plant operation. Utilisation of condensation heat could considerably alleviate the adverse impact of cooling waters on nature. In fact, the report (chapter 13.2.7) does include an analysis of the possibilities for cooling water reclamation, but the starting point of the report is very passive. It states that there are no such needs or facilities in the vicinity of the plant that could utilise the heat of the cooling waters. However, the Ministry of the Environment's view is that the utilisation of condensation heat should be analysed in more detail, considering the adverse effects caused to nature, and their prevention.

One of the key goals of the EIA procedure is to enhance the possibilities of citizens to participate in and influence decision-making. The report (chapters 3 and 9.11.5) includes a brief account of the topics discussed in meetings of the monitoring group, small groups, and in meetings with the general public. The report states that the issues highlighted in monitoring group discussions, pertaining to impact or the report itself, have been taken into account in the report, but the matter is not explained in any more detail. The report does not reveal whether the issues taken up in the small group meetings or meetings with the general public have influenced the EIA procedure.

The report says nothing about the selection of participants for the group meetings. On the basis of the report contents, it can be stated that opportunities for presenting opinions and participating in the EIA procedure have been arranged, but the actual impact of participation on the environmental impact assessment remains vague.

In this context, the Ministry of the Environment repeats the fact already presented in the statement on the EIA programme, that the report must reveal the results of participation and their impact on the environmental impact assessment. Moreover, the selection and picking of participants must be recorded in the report. Therefore, the Ministry of the Environment finds the EIA report insufficient in this respect.

TVO submitted its application for a decision-in-principle to the Ministry of Employment and the Economy on 25 April 2008. Although legislation permits this, the company did not comply with the recommendation given by the EIA contact authority in its statement on the EIA programme, to submit the application for a decision-in-principle to the Government after the conclusion of the EIA procedure. The Ministry of the Environment pointed this out in its statement as well.

A fundamental part of the EIA procedure is the public examination of the sufficiency of the EIA report. Opinions and comments submitted, and, finally, the contact authority's statement on the adequacy of the assessment form a key part of the EIA procedure and, for the party responsible for the project, they should constitute valuable material in compiling the permit applications and ensuring their comprehensiveness also as regards environmental issues.

In the opinion of the Ministry of the Environment, one could assume that an energy industry operator such as TVO, whose vision is to be '*a world-class nuclear power company highly valued by Finnish people*', should operate in a more responsible manner, showing an interest in the opinions of Finns, and other countries, on environmental impact, and in

whether the company's EIA can be considered sufficient on the whole.

In this context, the Ministry of the Environment repeats its opinion that the handling of the decision-in-principle should not commence prior to the conclusion of the EIA procedure. Furthermore, in the Ministry's view, the licensing procedure can only begin after the deficiencies indicated by the contact authority in the EIA report have been remedied and these alterations have been submitted to the Ministry of Employment and the Economy for attachment to the application for a decision-in-principle.

In summary, the Ministry of the Environment states that the issues handled particularly defectively in the EIA report are as follows:

- Reactor alternatives (plant types and size), their environmental impact and differences in terms of nuclear safety;
- Definition of emergencies, the potential impact of an accident or incident, and the methods applied in examination;
- Closing of the straits between the island of Kuusisenmaa and Olkiluoto, and the impact of closure of the straits/leaving the straits open, on the results of cooling water modelling;
- The extensions to storage and final disposal facilities for the purposes of nuclear waste management, and their environmental impact, and the impact on the current licences of nuclear waste management plants;
- The possibilities for utilisation of cooling waters; and
- The impact of participation on the assessment procedure and selection of participants.

In the opinion of the Ministry of the Environment, the abovementioned defects shall be remedied, the conclusion on the necessity of impact assessment regarding the Natura 2000 site corrected, and impact assessment carried out prior to proceeding with the project. The handling of the application for a decision-in-principle can only commence when all of the abovementioned completions have been made and submitted to the contact authority.

According to *the Ministry of the Interior*, the EIA programme has essentially been comprehensively prepared and the Ministry's Department for Rescue Services does not have any major suggestions for amendments at this stage of the project. However, the Department for Rescue Services regards cooperation to be of major importance between the local rescue services, parties participating in rescue services, and those implementing the project (section 10.5 of the EIA report). The Department for Rescue Services states that the instruction VAL 1.1 by STUK, Radiation and Nuclear Safety Authority, confirmed by the Ministry of the Interior, titled 'Guidelines on radiation protection in the event of radiation risk' describes and provides instructions for plans to be made in case of radiation emergencies.

In addition, the Department for Rescue Services points out that the planning of an extension to a significant nuclear power plant complex must include an assessment of whether it is expedient to place facilities with vast electricity production capacity close to one another. When the

impact of location is assessed, the multiplicative effects of an emergency taking place in such a complex should be considered.

The statement by the *Ministry of Social Affairs and Health* states that the EIA report of Olkiluoto 4, with appendices, is a paper with over 200 pages, describing the development of the need for electricity, the project itself, the purpose of the EIA procedure, technical specifications of the project, the regulatory and planning environment regarding licences, including safety aspects and monitoring obligations, providing the necessary geographic restrictions for environmental impact assessment, and describing the impact of construction, normal operating and decommissioning both on the environment and people, including the impact of the zero alternative.

The EIA report reviews nuclear safety and radiation protection aspects in emergencies, presents plans for constructing a new 400 kV line for transmission of electricity, considers the methods available for alleviating the adverse effects on people mostly due to increasing traffic volumes, particularly during the construction stage, and especially during service shutdowns of constructed plants, and finally, describes the environmental impact monitoring programme.

The report describes, in accessible language, the operating principles of both a pressurised and a boiling water reactor alongside 1) the principle of defence in depth, emphasised further 2) with multiple barriers independent of one another and 3) new technical requirements for enhancing the control of consequences of a serious reactor accident. The descriptions of these safety principles/requirements assist in understanding, in concrete terms, why the risk of a serious nuclear accident is minimal and that even in the worst case scenario, the risks to the general public remain minor and acceptable.

According to the Ministry, the EIA report of Olkiluoto 4 explains well, although not completely comprehensively, environmental health (the impact of non-radiating waste, noise, dust related to construction, traffic emissions and the maximum radiation doses on the inhabitants of the neighbouring area) and nuclear safety issues.

The EIA report emphasises the assessment of social impact, carried out on the basis of instructions by STAKES, the National Research and Development Centre for Welfare and Health. Comprehensive interviews have been conducted with the population of the area, and a special thematic interview has been conducted to acquire greater understanding regarding the opinions of people and any fears they may have concerning nuclear power plants. Furthermore, the report describes impact on employment and the regional economy both during the construction stage and normal plant operation.

In the view of the Ministry of Social Affairs and Health, the EIA report carried out for TVO by a consultant is accessible, based on realistic assumptions, and the report mainly complies with existing instructions on the assessment of social and health-related impact. The Ministry of Social Affairs and Health is of the opinion that the report is primarily based on appropriate knowledge of the basics of nuclear safety and radiation protection.

According to the statement by the *Ministry of Finance*, the Olkiluoto 4 project is vast and of major importance both on the regional and national scale. In the Ministry's view, the EIA procedure has achieved quite a comprehensive assessment of the key questions related to the project.

However, the Ministry of Finance wishes to draw attention to a few aspects that should be taken into account in further preparation of the project, one being the non-implementation of the project. Furthermore, the overall economic impact of the project is an issue, the assessment of which was not feasible in the EIA report. Naturally, the assessment of various energy policy options has not been possible for the party responsible for the project, because such assessments should be made by the Ministry of Employment and the Economy.

In the opinion of the Ministry of Finance, the EIA report available does not provide sufficient information regarding questions related to its sector, if a stand had to be taken on the issue, due to the application for a decision-in-principle regarding the overall interests of society. Hence the Ministry requests the Ministry of Employment and the Economy to ensure that possible further preparation of the project will provide a more precise assessment on the abovementioned issues, including impact on the overall economy, to facilitate further commenting on the issue if necessary.

*The Ministry of Agriculture and Forestry* comments in its statement on preparing for climate change. Chapter 10.7 describes the phenomena possibly caused by climate change, and preparation for them. On the basis of the report, for instance the impact of rising sea levels, would seem to have been appropriately analysed, but the report does not mention whether the expertise of other agencies, e.g. the Finnish Institute of Marine Research, has been used for the purposes of the assessment.

Furthermore, the Ministry draws attention to possible fish farming in the area, because chapter 9.7 of the report includes no mention of this kind of activity. The EIA report mentions the assessment of the inhabitants of the area within the sphere of influence of the project (illustration 9-56) on agriculture and forestry as a livelihood (power lines), but in the Ministry's opinion the assessment should assess other impact on agriculture, forestry and food production as well.

According to the statement by STUK, the Radiation and Nuclear Safety Authority, the EIA report covers questions related to STUK's sphere of authority at this stage of the Olkiluoto 4 nuclear power plant project. However, the sections of the report pertaining to the radiation safety of the general public and the environment do not provide fully comprehensive and up-to-date information.

Referring to specific points in the report, STUK presents specifying observations and remarks concerning information given in the report. The report on nuclear waste management in section 9.2.1 covers the storage of spent fuel and management of operating waste. As regards storage of spent fuel, the report describes current storage in the KPA interim storage facility at Olkiluoto, and refers to its planned extension.

On a general level, the report also describes the final disposal project for spent fuel.

According to the report, operating waste management is mostly based on currently used methods and the assessments of waste quantities correspond to those accumulating from the use of the existing power plant units. However, no new methods for reducing the volume of waste are mentioned. The intention is to expand the VLJ repository for final disposal by adding two silos to meet the needs of Olkiluoto 3 and Olkiluoto 4.

The final disposal of waste generated in connection with the decommissioning of the Olkiluoto nuclear power plant would require the construction of four additional silos and two pressurised container shafts in the area of the current VLJ repository, the underground facility for radioactive waste. The report also includes a general description of the impact of decommissioning a power plant unit from use and the final disposal of demolition waste. According to STUK, a specific EIA procedure will also have to be carried out for such measures.

The environmental impacts of emissions of radioactive substances are reviewed in several points of the report, and the review also includes an assessment, in table format, of the emissions of Olkiluoto 3 and Olkiluoto 4. Their differences in comparison with the current emissions of the power plant are not assessed verbally. Restrictions for emissions to air and water applicable to Olkiluoto 3 will be specified in connection with the commissioning of the plant unit in question. Experience shows that emissions from nuclear power plants in Finland causing radiation exposure to the population have been essentially below the set limits.

Moreover, STUK points out that in its statement on the EIA programme, the contact authority required that the impact of various disturbances and accidents should be described in the EIA report. However, the report only focuses on describing the impact of a serious accident in chapter 10.4.2, although it would have been more appropriate to describe a less serious reactor incident for comparison. As regards the impact of a serious accident within a range of 1,000 km, all that is essentially presented is the estimated dose in one table, and no reference report is given for the calculation that forms the basis for the report.

The civil defence description in section 10.5 is very narrow. In the vicinity of a nuclear power plant, iodine tablets will be distributed to the population in advance in areas within a radius of approximately five kilometres. The requirements laid down in e.g. the instruction VAL 1.1 by STUK, Radiation and Nuclear Safety Authority, confirmed by the Ministry of the Interior by decision 01285, TU-311, 15 June 2001, titled 'Guidelines on radiation protection in the event of radiation risk' are taken into account in the preparation and maintenance of rescue plan for population in the surroundings of a nuclear power plant.

Information regarding the commercial and industrial activities of the population in the surroundings have not been updated in the report, neither is this information included in the report section on civil protection. The safety reports of the Olkiluoto nuclear power plant

maintain an up-to-date description of the surroundings, the population and commercial and industrial activity.

Section 10.7, reviewing climate change, refers to a 2003 report by the Finnish Meteorological Institute that also handles estimates concerning rising sea levels. The EIA report states that the estimated rise in sea levels over the next few centuries varies greatly from one model calculation to another, and also that it is highly unlikely that the rising sea levels would exceed post-glacial rebound during the operating life of Olkiluoto 4.

Information on climate change corresponds with expert assessments acquired by STUK in other contexts, but the EIA report does not present the range of variation of the estimated rise in sea level, nor any numeric estimates for probabilities. In connection with handling of the potential construction licence application, STUK will estimate, on the basis of latest data acquired, whether the rise in sea level has been taken into account with a sufficient safety margin in the grade levels of the various facilities of the plant.

According to the contact authority's statement, the alternatives for cooling water intake and drainage options must be presented clearly, and any possibilities for remote intake and drainage must be examined. Section 13.2.5 only presents a qualitative analysis on the exclusion of cooling water remote intake and drainage. In STUK's opinion, the implementation of an alternative cooling water solution must be examined further, with attention to both the environmental impact and overall safety of the nuclear power plant, in connection with the possible application for a decision-in-principle and construction licence.

According to the statement by the *State Provincial Office of Western Finland*, the EIA report is comprehensive and takes account of different impacts in a diverse manner. The report is illustrative and easy for readers to understand. The report examines health-related and social impact on people in the extent presented in the programme, and the impact of the need for workforce on employment, commercial and industrial activity in the locality and the neighbouring regions, both during the construction of the plant and its use, have been analysed.

The report illustrates the analysed impact well, but the maps describing noise levels are too small because the names of islands are hard to discern and they do not show the names of the closest localities affected (however, these facts are stated in the text).

According to the statement of the *Regional Environment Centre of Southwest Finland*, the environmental impact assessment of Olkiluoto 4 was carefully conducted but it contains some defects. As a whole, the EIA report is a clear and illustrative report, but in the environment centre's view certain defects remain in the assessment that require supplementation of the impact assessment in the licensing procedures necessary for the project.

The environment centre also points out that the EIA report has only partly taken into account the views the environment centre presented regarding the assessment programme. Alternatives and their handling



are presented appropriately in section 2.4, but the review does not handle energy saving on the basis of the contact authority's statement.

Cooling water reclamation is defectively presented according to the environment centre, which is of the opinion that utilisation of condensation heat must be actively analysed further, with attention to costs. The calculations must also pay attention to adverse effects on nature and climate, and their prevention.

According to the environment centre, the impacts of the project have been extensively handled, but the environment centre does not agree with TVO's conclusions on the handling of the Natura sites (section 9.10.3) and potential assessment in accordance with section 65 of the Nature Conservation Act. According to the environment centre, the assessment of the Rauma archipelago site (FI0200073) in question must be carried out in connection with the licensing procedure at the latest. Furthermore, the environment centre will submit its statement on the sufficiency of the Natura assessment in compliance with subsection 2, section 65 of the Nature Conservation Act, in connection with the licensing procedures required for Olkiluoto 4.

*The Occupational Safety and Health Inspectorate of Turku and Pori* has no comments on the EIA report.

According to the statement by the *Safety Technology Authority (TUKES)*, it has been estimated that the quantities of chemicals of the prospective plant are in the same relation as in the currently operating plants, Olkiluoto 1 and Olkiluoto 2, and Olkiluoto 3, under construction, even if the EIA report does not include detailed information on dangerous chemicals used. Accordingly, TUKES has no comments on the project.

*The Satakunta T&E Centre* has no comments to make on the EIA report.

According to the statement by the *South-Western Finland T&E Centre*, the location of the discharge site of cooling waters is crucial for the fishing industry. Of the alternatives presented in the EIA report, introduction of the discharge site located farther north on the other side of the cape of Ulkopää is more detrimental for the fishing industry because it would cause the thermal load to spread further to the north and affect the temperatures of Eurajoensalmi more.

Furthermore, the T&E Centre points out that the warm water may interfere with the migratory instinct of some fish species, thus preventing their migration into the rivers of Eurajoki and Lapinjoki. The EIA report does not include a sufficient analysis of this impact on migratory fish species. From the viewpoint of fish industry development in Eurajoki, it would be extremely harmful if the migratory fish, imprinted with River Eurajoki, were no longer able to return to their home river due to the warm cooling waters.

The statement of the *Satakuntaliitto Regional Council* states that the comments it presented on the EIA programme have primarily been taken into account in the EIA report, and on the basis of the approved

regional plan and other related plans, it has no comments on the EIA report. Furthermore, the regional council states that the Satakunta regional plan 5 (KHO 4.4.2001), approved by the Ministry of the Environment on 11 January 1999, has prepared for additional power production construction projects in Olkiluoto. Currently preparing a provincial plan to replace the present regional plan, Satakuntaliitto regional council will observe the changed needs in the area. The material of the preparatory stage will be available for public viewing in spring 2008.

*The Municipality of Eurajoki* finds no cause to criticise the EIA report. However, Eurajoki considers it important that a detailed study of the impact of cooling waters on the immediate vicinity of the drainage area and on the wider marine area near Olkiluoto be conducted. The municipality states that analyses indicate that the cooling waters of the new unit will increase the area of surface water that will warm up by over one degree Celsius, by approximately 1.5 times in comparison with the zero alternative.

Furthermore, Eurajoki considers it vital that the impact on people and the society have been assessed, and in the municipality's view, interaction has been lively during the EIA procedure and for instance information events and public meetings have been arranged for the general public and small groups. These meetings have provided members of the public the opportunity to voice their opinions and obtain further information about the project and its environmental impact.

According to the *Municipality of Eura*, it stated in the statement on the EIA programme that environmental impacts are assessed in too small an area, the assessment of rescue missions is not carried out, nor is the impact of power transmission links examined. In the opinion of the Municipality of Eura, the EIA report does not handle the aforementioned viewpoints to a sufficient extent, and it is particularly unfortunate that the assessment of the impact area has not been extended to cover the neighbouring municipalities of Eurajoki as wished. For instance, the residents' questionnaire targeted resident groups only in the neighbouring areas of the proposed location of the power plant.

According to the Municipality of Eura, the assessment of financial impact does not examine the impact on the availability of workforce, nor the impact on salary planning and other similar costs in the Rauma region or in Satakunta. Due to these issues, these parts of the EIA report should be completed.

*The Municipality of Lappi* maintains that the entire EIA process should have been extended to a wider area, covering the neighbouring municipalities of Eurajoki. Lappi already stated this in its statement on the EIA programme, but the EIA report does not take this comment into account in any way. The environmental impact of power transmission lines should also have been reviewed during this EIA process, not leaving this to a separate EIA procedure. The municipality's statement also points out that the EIA report should pay more attention to the experiences gained from the impact of constructing the third plant (which is underway) both at the construction site and the society surrounding the plant.

According to the statement by the *Municipality of Luvia*, the EIA report is mainly clear and illustrative, as it contains a comprehensive presentation of the project and various alternatives, with environmental impact, and expresses the issues required by the EIA Decree. The reports and assessments required by Luvia on the EIA programme are mainly included in the EIA report, but the assessment of traffic volumes on Highway 8 should have included the situation regarding Luvia for instance concerning traffic volumes in the mid-2010s, when Olkiluoto 3 will possibly have been commissioned and Olkiluoto 4 would be under construction.

*The City of Rauma* emphasises the impact of the thermal load on the sea, created by the current and the planned facilities. The impact of the thermal load of cooling waters on the sea have been explained widely, including a description of alternative cooling techniques. The possibilities for preventing and alleviating the adverse effects (chapter 13) are minimal in relation to the environmental impact of the thermal load.

The impacts of climate change have been assessed as a separate topic under preparation for exceptional situations (chapter 10.7). According to the City of Rauma, the discharge of cooling water into sea water, which is already warmer than before due to climate change, will influence the sea ecology in ways that are hard to outline (Chapter 9.7). The impact of a general increase in sea water temperature involves many factors of uncertainty that may be at hand at the possible environmental permit stage of the project.

According to the *Municipality of Kiukainen*, the impact of power transmission on the environment should already have been considered in this EIA report to some degree at least, but the municipality has no other comments to make on the EIA report.

*The Federation of Finnish Enterprises* finds no cause to criticise the EIA report.

*The Confederation of Finnish Industries EK* finds the assessment report comprehensive in its statement, as it provides a full and balanced picture of the key information and reporting needs arising from the EIA procedure in accordance with the EIA Decree. Furthermore, the EIA report pays sufficient attention to the issues presented in the contact authority's statement on the EIA programme.

*The Finnish Energy Industries'* statement considers the EIA report comprehensive and professionally prepared. The organisation's statement also handles the social significance of the project and supports the view of TVO regarding the need to construct new electricity production capacity to satisfy increasing power consumption and to replace old power plants removed from active use.

According to the statement by *Greenpeace*, the EIA report has not even attempted to assess the impact of a serious nuclear accident, because Greenpeace claims that the emission quoted as the basis for nuclear accident only accounts for approximately one ten-thousandth part of the radioactivity contained in a modern reactor. Therefore, Greenpeace

demands that the quantity of radioactive substances used in analysing a nuclear accident should correspond to that of a modern nuclear reactor with high discharge burnup. Furthermore, Greenpeace criticises the way TVO proposes to prepare for the costs of a nuclear accident and health hazards.

Greenpeace also states that the prospective nuclear power plant project would not have an impact on the need for reducing greenhouse emissions in Finland or Europe, because if the project remains unimplemented, Finland will reach the emission targets by other means. A true alternative to TVO's project would be an energy solution involving the meeting of energy needs by enhancing energy efficiency and the use of renewable energy in diverse ways, without increasing the use of nuclear power and fossil fuels or the import of energy.

*The Finnish Association for Nature Conservation* observes in its statement that the aggregate impact of the project with the cooling waters of Olkiluoto 3 and other climate warming is so significant for the Natura 2000 site that a special assessment pursuant to section 65 of the Nature Conservation Act should be carried out.

The Association considers it vital that the statement by the EIA report contact authority be given and possible additional analyses conducted prior to further handling of the application for decision-in-principle. Any proceedings contrary to that would underline the approximate nature of the EIA programme, which already is suggestive only for many parts (assessment of project alternatives, minor attention to problems of nuclear waste, and the approach to a serious reactor accident).

The statement by the *Regional District of Satakunta of the Finnish Association for Nature Conservation* finds that the district does not consider the additional construction of nuclear power sensible as regards the overall interests of society, given the problems that have already arisen during the ongoing project (Olkiluoto 3).

*Fingrid Oyj* notes in its statement that under the Electricity Market Act, it is obliged to bear systems responsibility and develop the grid. The company examines the needs for reinforcing Finland's main power transmission network, i.e. the main grid, as a whole. The predicted changes in the needs for power transmission, and the resulting needs for reinforcing the power transmission network, are based on long-term forecasts for electricity consumption, the development of electricity production capacity, alongside the development of electricity import and export.

Fingrid Oyj has investigated how the Olkiluoto 4 plant could be connected to the national grid, and examined the reinforcement required in the grid, based on plant planning data received from TVO. The plan is to connect the plant to the main grid via a new main distribution unit to be constructed beside the current Rauma electricity station. New 400 kV line links will be needed to connect Rauma to the directions of Lieto, Forssa and Ulvila. The required network reinforcements in plant connection and at other places in the main grid are taken into account in the provincial planning by regional councils.

By including the power line routes of the national grid in the provincial plans, Fingrid ensures the management of nationwide power transmission needs in future. To support provincial planning, Fingrid will prepare a report on the line links, including the need for a power line, the building stock in the examined area, planning status and natural conditions.

Fingrid has launched environmental impact assessments of new power lines in Ostrobothnia, Eastern Finland, and Häme, included in the national grid development plan. Moreover, the company will advance the environmental assessments of power line projects related to increasing the transmission capacity between Sweden and Finland, and Northern and Southern Finland. These basic solutions will contribute to supporting the linking of new power production sources to the national grid.

After the decision-in-principle, Fingrid will launch environmental impact assessment procedures for connecting power lines depending on the location of the plant, and reinforcements of the national grid. The quantity of connecting power lines needed, the width of the power line route, and reinforcements of the national grid will be decided once the final size of the plant, its technical solutions and the technical values of the plant have been specified.

Based on its systems responsibility, Fingrid is also responsible for the quantity of nationwide power system disturbance reserves. The need for new production reserves, and reserve capacity, depends on the size of the new power plant unit, the overall development of other production capacity, consumption development and the development of import and export of electricity. The location of disturbance reserves must be assessed as a whole. By means of land use and plans, Fingrid is prepared for the construction of a new reserve capacity unit, serving the entire power system, in Olkiluoto, in connection with the current gas turbine power station.

*Posiva Oy* states that it has had the opportunity to comment on the EIA report at various stages of its preparation, and TVO has taken *Posiva's* views into account sufficiently in the EIA report.

*Naturvårdsverket*, the Swedish Environmental Protection Agency, arranged a hearing in Sweden, whereby 14 authorities and organisations gave comments. The Swedish nuclear safety authority, *SKI (Statens Kärnkraftinspektion)* finds in its statement that its comments at the programme stage have been taken into account in the EIA report, as for instance the environmental impact assessment of possible accident situations covers the entire Baltic Sea area and the impact of alleviating any adverse effects have been assessed, too.

Other comments invited by the Swedish environmental authority emphasise the assessment of radioactive emissions from several perspectives. The Swedish Radiation Protection Authority, *SSI (Statens strålskyddsinstitut)*, points out that the EIA report does not handle the radiological details of long distance radioactive fallout caused by a possible accident, although such information is interesting despite the small doses caused to people.

Attention has also been paid to alternatives to nuclear power, and for instance the energy authority *Energimyndigheten* states that the use of renewable energy forms should have been described more thoroughly.

*The Ministry of Environment*, the environmental authority of Norway, finds in its statement that according to table 10-1, the people of Norway would be exposed to relatively small doses in a possible accident at Olkiluoto 4. However, Norway points out that the methods for compiling the table, and calculations, have not been reviewed. Therefore, Norway would like to obtain a report presenting the accident scenarios, methods and risk assessments used in establishing the maximum radioactive emissions that would drift to Norway, and the extent of radiation doses that would follow.

Norway also observes in its statement that it is positive that the new radiation protection recommendations by IRCP have been taken into account in assessing the environmental impact on flora and fauna.

*The Ministry of the Environment*, the environmental authority of Estonia, finds in its statement that the EIA report meets the requirements of the Espoo Convention and is therefore suitable for describing accident situations and their potential environmental impact. Estonia observes that according to the EIA report, the probability of accident situations is in the category of once in 100,000 years. Furthermore, Estonia states that in accident situations, STUK would inform the neighbouring countries in accordance with international conventions, but the EIA report should include a more specific description of this (e.g. which laws will be applied and how the operations will proceed).

The statement also points out that a public hearing was arranged in Estonia on 28 March 2008, and that Estonians were able to present opinions or give comments from 1 March to 30 April 2008.

*The Ministry of Environment of Lithuania* presents some questions in its statement, which it hopes that TVO would provide replies to in writing. The questions concern for instance the emission standards of the currently used nuclear power plant units of Olkiluoto 1 and 2, and the intended tritium emission standards of plant units Olkiluoto 3 and Olkiluoto 4.

In Austria, the *Federal Ministry of Agriculture, Forestry, Environment and Water Management* is the national representative in the process pursuant to the Espoo Convention. In a letter addressed to the Finnish Government in February 2008, the Ministry affirmed that Austria would participate in the EIA procedure.

In May 2008, Austria submitted a report to Finland by the Austrian environment authority, Umweltbundesamt, (authors included the Österreichisches Ökologie Institut and Lebensministerium), titled "NPP Olkiluoto-4 Expert Statement to the EIA report", undated expert statement, Vienna, 2008 (46 pages).

According to the report, the project does not meet the requirements set forth in the EC EIA Directive (EC 97/11) and the Espoo Convention, because the EIA report does not present the project in sufficient detail,

particularly as regards the various alternatives of the project. According to the report, emissions caused by a potential accident cannot be assessed without knowing, for instance, what the reactor type of the nuclear power plant in question would be. According to the report, the EIA report does not provide sufficient information on the alternatives presented by TVO.

The Austrian report suggests that emissions in an emergency should be based on the so-called worst case scenario, and the 100 TBq emission of Cesium 137 isotope, that TVO uses as basis, is questionable.

Moreover, the Austrian report criticises the environmental impact assessment of nuclear fuel sourcing, the processing of spent fuel at the plant facility, and the final disposal concept of spent fuel. According to the report, it is not correct to use the MIPS-indicator (Material Input Per Service Unit) for the handling of nuclear power plant alternatives, as the EIA report does, because it does not take into account all actual costs and risks involved in nuclear power production.

On 26 May 2008, the Ministry of the Environment arranged a consultation meeting in Helsinki with Austria in accordance with the Espoo Convention. Thereafter, Austria sent a letter on 11 June 2008, including recommendations for Finland regarding the EIA procedure concerning phenomena of a serious reactor accident, particularly the so-called source term.

## **Other comments and opinions**

This summary introduces issues and views that have been presented or highlighted in other comments or opinions. A total of 93 other comments or opinions were submitted, of which nine were made by communities and organisations, and a total of 82 comments or opinions by eleven private persons.

The following organisations presented a comment or opinion: Plattform gegen Atomgefahren, Wiener Plattform "Atomfreie Zukunft", Women Against Nuclear Power, Women for Peace in Finland and Amandamij (joint comment), Miljöorganisationernas kärnavfallsgranskning MKG, the International Network "Artists for A Clean Future", the Edelleen ei ydinvoimaa Popular Movement Against Nuclear Energy, Lappilaiset Uraanivoimaa Vastan Popular Movement of Lapland against Nuclear Energy, and Fennovoima Oy.

Several comments or opinions 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 operating of a nuclear power plant, including emergencies, the decommissioning of facilities, nuclear waste management and transport.

The comments also mention the project's social significance and address the need to assess other alternative means of energy production. Several comments or opinions do not present views relating

to the EIA report in addition to the aforementioned comments, but oppose the use of nuclear energy in general.

*Kai Virtanen* is of the opinion that the EIA report does not handle nuclear waste management to a sufficient degree, particularly as concerns the final disposal of spent fuel. The EIA report describes nuclear waste management safety based on the assumption that events in the vicinity of the final disposal facility of nuclear waste can be predicted for hundreds of thousands of years forward. However, he regards this assumption as false. The EIA report is defective because it does not examine whether there is a more secure way of preventing radioactive substances from being released from nuclear waste to organic nature than the final disposal solution described in the report.

The statement by *Fennovoima Oy* finds TVO's description of final disposal of spent fuel insufficient, particularly in terms of the political decisions related to the matter, and states that completion of the report would be necessary in order to gain a correct view of the content of decisions made.

## 4 Contact authority's statement

The Ministry of Employment and the Economy finds the EIA report essentially adequate, but certain topics require further clarification before the consideration of the application, submitted by TVO on 25 April 2008 on the construction of a nuclear power plant, with a view to arriving at a decision-in-principle, can commence regarding the application's essential parts. Section 4.7 contains a summary on the issues that should be handled in the supplementary report.

### 4.1 Project description and the alternatives

The assessment report presents the power range and potential types of the proposed power plant, including a description of the operating principles of pressurised water and boiling water reactor plants, and presenting, in table format, plant alternatives that can be considered. The description does not fully meet the recommendations of the Ministry of Trade and Industry regarding the EIA programme, and the Ministry of the Environment pays attention to the same issue in its statement.

The Ministry finds that the supplementary report to be made should include more specific technical data of the nuclear power plant types presented in TVO's application for a decision-in-principle, dated 25 April 2008. The Ministry recommends that in this context, the basics for safety planning of the prospective plant should be presented as regards restriction of emissions of radioactive substances and environmental impact, and an assessment of the possibilities to meet safety requirements in force.

In addition to the abovementioned analysis, several statements suggest that energy saving and energy efficiency should be reviewed, too, alongside a more thorough presentation of renewable energy forms and other energy policy comments. The Ministry maintains, as in the



programme stage, that the organisation responsible for the project is a company that generates power only for its shareholders. Therefore, it cannot access any significant means of energy conservation or efficiency. The applicant's own energy conservation and efficiency measures are presented to a sufficient extent in section 4.5.

Furthermore, the Ministry notes that the report on the importance of a new nuclear power plant or power plants to the national energy supply (Nuclear Energy Act, section 14), 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 would cover the Finnish energy supply as a whole and thus could not, as such, be applied to the issue of replacing the power plant under review.

Moreover, the Ministry emphasises that the Government is planning a long-term climate and energy strategy, also commenting on the further usage of renewable energy forms in Finland. The Ministry also takes account of the comments of the Ministry of Finance regarding overall economic reviews, when launching the handling of the crucial parts of the application for a decision-in-principle.

#### 4.2 Impact analysis and assessment of significance

The Ministry of Employment and the Economy finds the impact of cooling waters the most significant environmental impact during normal plant operation, and cooling water solutions also emphasise the comparison of various options. Section 4.3 deals with this.

The new nuclear power plant unit requires an improvement in the power transmission links, which the EIA report does not comment on. Fingrid Oyj has investigated how the Olkiluoto 4 unit could be connected to the national grid, and examined the reinforcement of the main grid based on information received from TVO on the facilities, while presenting the required measures in its statement. The Ministry does not recommend a situation where the EIA procedures of projects related to the nuclear power plant project take place at different times, but can accept the situation, because the organisation responsible for the national grid must take account of all other power plant projects as well, alongside other aspects influencing the issue.

In the contact authority's statement on the EIA programme, the Ministry of Trade and Industry stated that potential phenomena caused by climate change, and preparation for them (sea level variations, other exceptional weather phenomena) must be handled as part of the exceptional situations regarding a nuclear power plant.

Several statements also voice particular concern over how the rise in sea levels is taken into consideration. The EIA report presents sea level variations, snow storms and other possible scenarios. In addition, the Ministry points out that the Finnish Research Programme on Nuclear Power Plant Safety (SAFIR2010) involves a long-term project aiming to recognise future special weather phenomena and risks involved for nuclear power plant localities. In connection with the handling of the

potential construction licence application, STUK will estimate, on the basis of the latest data acquired, whether the rise in sea levels has been taken into account with a sufficient safety margin in the grade levels of the various facilities of the plant. The Ministry finds the analyses presented in the EIA report sufficient.

In the contact authority statement on the EIA programme, the Ministry of Trade and Industry stated that the assessment of the environmental impact of traffic should pay particular attention to defining the impact assessment area so as to include traffic arrangements for the junction of Road 2176 and Highway 8. Furthermore, the Ministry's statement required TVO to examine joint impact with other projects under construction and planning. In the Ministry's view, the EIA report includes a sufficient assessment of the environmental impact of traffic (8.6 and 9.3), including the aggregate impact of various projects and the measures taken to alleviate adverse impact (13.1).

In the contact authority's statement on the EIA programme, the Ministry of Trade and Industry required that with regard to the socio-economic review of the EIA procedure, a detailed assessment should be provided of the project's impact on employment, during both the construction and operational stage of the power plant.

According to the EIA report (9.11.4), construction of the power plant unit would take between six and eight years, and TVO estimates the power plant unit's degree of domestic origin to be 35 – 45%. The EIA report does not reveal the studies used as the basis for the estimates, or the methods of analyses conducted.

The statement of the Ministry of Finance also points out that the EIA report does not include sufficient information regarding questions of its sector, and also refers to the employment analyses made. In the Ministry's view, the figures stated above differ significantly from the concepts that prevailed some years ago. Due to the narrow scope of the analyses made, the supplementary report to be made should continue the assessment of employment impact.

In the contact authority's statement on the EIA programme, the Ministry of Trade and Industry stated that Olkiluoto is an area undergoing major changes. According to current plans, Olkiluoto 3, under construction at present, will commence operating in 2011. In addition to Olkiluoto 3, Posiva is building an underground research facility, ONKALO, in the area, intended to form part of the final disposal facility for spent nuclear fuel. At present, Posiva expects to apply for a construction licence for its final disposal facility for spent nuclear fuel by the end of 2012, intending to commence final disposal of spent nuclear fuel in 2020. Moreover, TVO is planning to expand the interim storage facility for spent nuclear fuel (KPA storage) and possibly also the underground final disposal facility for operating waste (VLJ repository).

According to the EIA programme, the organisation responsible for the project will examine the environmental impact of nuclear fuel production and transport, including mining, concentration and fuel manufacturing. The environmental impact assessment is based on existing analyses. Some comments point out that the environmental impact of the entire

production chain of nuclear fuel should be considered as the environmental impact of the project. However, in the Ministry's view the general review by the organisation responsible for the project of the environmental impact of the entire sourcing chain and the company's possibilities to influence this chain is adequate.

In the contact authority's statement on the EIA programme, the Ministry of Trade and Industry stated that the EIA report should describe the quantity, quality and treatment of radioactive waste generated at the plant unit, and assess the related environmental impact. The environmental impacts of the final disposal of spent nuclear fuel are to be described using the results of the EIA procedure carried out by Posiva Oy in 1999 and the studies carried out thereafter. The Ministry also maintained that the report should review nuclear waste management as a whole, including extensions to the necessary storage and final disposal facilities and their environmental impact.

The Ministry of Employment and the Economy finds the description of waste management to be of suitable scope on a general level, but points out that on 5 June 2006, the Ministry of Trade and Industry issued a statement on applying the EIA procedure to the extension projects of both the KPA storage facility and the VLJ repository. The EIA report does not mention this. It should be noted that the statement had been prepared before the commencement of Olkiluoto 4 project.

The Ministry's statement said that the generation of spent fuel is the inevitable consequence of normal nuclear power plant operation. Storage of spent fuel in the manner suggested by TVO, i.e. by increasing the capacity of the existing KPA storage facility, does not cause any significant adverse environmental impact as referred to in the EIA Decree, Section 6, subsection 7 (b-d). Therefore, the Ministry of Trade and Industry found that the environmental impact assessment procedure would not have to be applied to extending the KPA storage facility in the manner suggested by TVO.

Furthermore, the Ministry's statement of 5 June 2006 found that the physical expansion of the VLJ repository would not be topical for several years yet, and the necessity of a possible EIA procedure prior to the licensing procedures of the expansion in question, in accordance with the Nuclear Energy Act, would come up for consideration in due course. The increasing quantity of operating waste to the VLJ repository, generated by Olkiluoto 3 nuclear power plant unit, or other changes to the VLJ repository suggested by TVO cannot be considered to cause any such significant adverse environmental impact as referred to in the EIA Decree, Section 6, subsection 7 (b-d). The Ministry of Trade and Industry found that the implementation of changes to the VLJ repository in the manner proposed by TVO would not establish the need to apply the EIA procedure.

The statement by the Ministry of the Environment points out other deficiencies in how the EIA report presents nuclear waste management. However, the Ministry of Employment and the Economy finds that the EIA report examines the relations between Olkiluoto 3, the ONKALO final repository facility, Olkiluoto 4 and other projects being planned in a

sufficiently illustrative manner so as to provide an adequate overview of the status of Olkiluoto and changes thereto.

#### 4.3 Comparison of alternatives and viability

The EIA report presents calculation cases for cooling waters in a conservative way and so thermal loads caused by all four units are taken into account.

In the contact authority's statement on the EIA programme, the Ministry of Trade and Industry found that when analysing the environmental impact of sea water warming, any background material available should be utilised extensively and the analyses be linked on a wider scale to the state of sea areas in the Bothnian Sea and the Baltic Sea. Uncertainties in calculation results must be illustrated clearly. In addition, the alternatives for cooling water intake and drainage options must be presented clearly, and any possibilities for remote intake and drainage must be examined. Moreover, the utilisation of cooling waters should be analysed.

The statement by STUK comments on the possible remote intake and drainage options, but the Ministry of Employment and the Economy finds, that the limited impact of the project on the status of the Bothnian Sea in the area and the vicinity of Natura sites have contributed to the adequacy of the verbal analysis included in the EIA report. Also the reclamation analysis of the EIA report (13.2.17) is sufficient in the Ministry's opinion, because there are no suitable locations for heat recovery in the vicinity, nor is the construction of significant heat reclamation facilities realistic in the current situation.

The EIA report states (8.2) that the island of Kuusisenmaa is situated to the west-south-west of the Olkiluoto power plant site, separated by shallow straits of approximately 200-300 metres in width. The plan is to close the straits in order to diminish the impact of cooling water recirculation and enhance the monitoring of the Olkiluoto area.

According to the environmental permit decisions (LSY-2003-Y-30 and 31 of 19.6.2006) by the Western Finland Environmental Permit Authority, power plant units' cooling water intakes are located in a relatively shallow water area, and in terms of flows, at a distance of only one kilometre from the drainage site of cooling water. Therefore, recirculation of cooling water is possible, and if it occurs, it can influence the power plant's operating efficiency. Because of the high efficiency of the power plant, even a minor change in operating efficiency is significant in terms of energy efficiency and thermal load on the environment (Environmental Protection Act, section 43).

The intention to close the straits is based on the permit condition of the environmental permit granted by the Western Finland Environmental Permit Authority, but the EIA report does not mention this. According to the permit decision, "the licensee must analyse any possible recirculation of heated cooling water into the intakes of cooling water, assess the significance thereof in terms of the power plant's energy efficiency, and

present, on the basis of the analysis, potential measures to diminish or prevent circulation.”

According to the environmental permit authority, the report must be submitted to the Regional Environment Centre of Southwest Finland within three years of commercial commissioning of Olkiluoto 3, therefore making it not actual at present.

The EIA report illustrates the plan of an embankment closing the straits for instance on the maps on pages 112 - 113, and it is also shown in the conceptual image on the cover of the EIA report. Cooling water modelling calculations included in the EIA report are based on the existence of this embankment, and model calculations are not presented without the embankment.

The statement by the Ministry of the Environment points out facts regarding which the environmental impact of closure of the straits are defectively analysed. The Ministry of Employment and the Economy agrees with this opinion and points out that the environmental impact of closure of the straits and the construction of the embankment are not sufficiently elicited. Furthermore, the design criteria, planning and required permits for the prospective embankment remain completely unexplained. Therefore, the Ministry requires a supplementary report on the closure of the straits and the environmental impact thereof, including an assessment of how the results of the cooling water models would differ from those presented in the EIA report without the embankment.

The contact authority required in its statement on the EIA programme that the need for Natura assessment of the Rauma Archipelago Natura site FI0200073, in accordance with section 65 of the Nature Conservation Act, should be established. On the basis of analyses made, the EIA report concludes (9.10.3) that based on current information, it is not probable that the consequences of the project, in relation to the entire Natura site, would be so significant and extensive that they would endanger the level of favourable protection in the subaquatic habitat type. Therefore, TVO does not regard an assessment procedure necessary.

However, the Regional Environment Centre of Southwest Finland and the Ministry of the Environment share a different view on the matter, deciding to forcefully recommend a Natura assessment. For instance, the Ministry of the Environment states that the assessment must be conducted unless it can be objectively proven that no significant adverse effects would be targeted at the Natura site. Therefore, the Ministry of Employment and the Economy finds that a Natura assessment in compliance with section 65 of the Nature Conservation Act shall be conducted on the Natura site FI0200073, Rauma Archipelago, located at a minimum distance of approximately two kilometres from Olkiluoto. The planning of this Natura assessment shall commence without delay, and the schedule for the assessment must be included in the supplementary report.

#### 4.4 Prevention and monitoring of adverse effects

Nuclear safety standards set the framework for prevention of harmful radiological impact. Furthermore, monitoring methods developed since the 1970s are based both on the power company's own measures and on supervision by STUK. The environmental impact assessment of emergencies must take into account advanced nuclear safety technology and continuously advancing supervision by authorities. In the Ministry's view, the EIA report presents these measures and the environmental assessment of emergencies mainly to a sufficient extent.

In the contact authority's statement on the EIA programme, the Ministry stated that the EIA report must present various emergency scenarios involving radioactive emissions and, with the help of illustrative examples, describe the extent of affected zones and the impact of emissions on people and the environment and present a clear summary of the grounds for analyses made. The assessment also had to include a review of possible environmental impact of radioactive substances on the states around the Baltic Sea and on Norway.

The EIA report handles a serious reactor accident of category 6 on the INES Scale of the International Atomic Energy Agency IAEA, resulting in emission of 100 TBqs of cesium 137 isotope. Of the impact of a serious accident at a distance of 1,000 kilometres, the report essentially only presents the radiation dose values of highest human exposure, in table 10.1. However, the analysis forming the basis for the table is not presented, although some information is provided on the weather and time of year. No analysis on the environmental impact of a less severe accident scenario is presented, although section 10.4.1 does list the requirements pertaining to exceptional situations.

The EIA report includes very little information on the transboundary environmental impact caused by a potential serious reactor accident. The separate EIA report summary, submitted to states participating in the international EIA procedure, includes a brief review in section 3. The table of radiation doses of most highly exposed residents up to a distance of 1,000 kilometres is included in this presentation. Moreover, the reports states that the project has not been recognised to have any other radiation impact beyond the national borders of Finland than those of a potential reactor accident. For instance, the impact on Norway or other Baltic Rim nations have not been presented in the separate summary.

As regards the information presented in the table, the statement by the Radiation and Nuclear Safety Authority (STUK) draws attention to the fact that the list of literary sources does not include a reference report, while the statement by the Ministry of the Environment emphasises that it is vital that the reviews of various accident scenarios and descriptions of accident impact are clear and understandable. Moreover, the Ministry of the Environment points out that transboundary environmental effects should primarily be described in the actual EIA report, not only in the summary document translated into different languages.

The statement by Greenpeace, the expert report submitted by Austria, and a number of other opinions and comments sent to the Ministry

establish that in connection with the selected serious reactor accident, the estimated quantity of radioactive substances emitted to outdoor air is much too low and, according to Greenpeace, it should be in a category 10,000 times higher.

On 11 June 2008 Austria sent a letter to Finland including recommendations for Finland on the EIA procedure pertaining to the international consultation procedure in compliance with the Espoo Convention. The recommendations handled phenomena of a serious reactor accident, the so-called source term in particular, which describes the radioactive substances emitted to outdoor air and their quantity.

The comments by Lithuania, Norway and Estonia include questions that the countries in question would like to receive replies to in writing. In its letter dated 28.5.2008, reference YM4/5521/2007, the Ministry of the Environment requests the Ministry of Employment and the Economy to ensure that the replies to questions posed by these countries will be provided in writing.

The Ministry of Employment and the Economy finds that the emission of 100 TBqs of cesium 137 isotope emitted to outdoor air as result of a serious reactor accident, selected as the accident scenario, is justified because it is naturally based on Finnish legislation governing the use of nuclear energy (Government resolution VNp 395/91 and STUK YVL Guide 2.8 on operating nuclear power plants), in which the expected value of emission frequency exceeding the limit value of a serious reactor accident shall be less than five times in ten million years.

The Ministry requires TVO to present the methods used for accident reviews in its supplementary report, paying attention to information regarding the methods used for preparing estimates on potential transboundary environmental impact.

The Ministry also requires that replies must be provided to questions presented in the comments by Lithuania, Estonia and Norway, and these replies shall also be translated into English (in accordance with section 22 of the EIA Act), and enclosed with the supplementary report. The Ministry of Employment and the Economy will submit the replies to the Ministry of the Environment, responsible for the international hearing. A separate reply will be provided to the recommendations to Finland by Austria in connection with the consultation under the Espoo Convention.

The supplementary report must also include a short assessment of the environmental impact of an accident less serious than the serious reactor accident presented in the EIA report, e.g. an accident in categories 4-5 on the INES Scale of the International Atomic Energy Agency IAEA.

Chapter 13 of the EIA report focuses on prevention and alleviation of adverse impact, while chapter 14 handles the environmental impact monitoring programme. In the Ministry's view the circulation for comments has not revealed any facts that would indicate that the EIA report would not pay sufficient attention to the prevention of adverse impact or that the EIA programme would be deficient in this respect.

However, several comments draw attention to the fact that the island of Olkiluoto forms an entity.

As regards the EIA programme, the Ministry points out, as does the Ministry of the Environment, that the habitat types of the aforementioned Natura 2000 site must be placed under such monitoring that can at a later date prove the correctness of conclusions made in the Natura assessment to be prepared. This can also be of significance in the handling of future licences.

In the opinion of the Ministry of Employment and the Economy, prevention of adverse impact has been taken into account to a sufficient degree in the project and the monitoring programme is adequate.

#### 4.5 Arrangements for participation pertaining to the EIA procedure

The MEE considers that arrangements for participation during the EIA procedure have been made according to the plan presented in the assessment programme.

However, the Ministry recommended in its statement on the EIA programme that 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. TVO has invited representatives of neighbouring municipalities to join the monitoring group. However, the municipalities of Eura and Lappi state in their comments on the EIA report that they have not been able to influence the EIA procedure to a sufficient degree.

The Ministry of the Environment mentions in its statement that one of the key goals of the EIA procedure is to enhance the possibilities of citizens to participate in decision-making and influence it. Moreover, the Ministry states that the EIA report includes a brief account of the topics discussed in meetings of the monitoring group, small groups and public events. Furthermore, it is stated that the issues highlighted in monitoring group discussions regarding impact or the report as such have been taken into account in the report, but no further details on the matter are given. According to the Ministry of the Environment, the report does not reveal whether the matters highlighted in small group meetings and public events have influenced the EIA procedure.

The Ministry of Employment and the Economy also wishes to draw attention to the aforementioned aspects. The actual impact of participation on the environmental impact assessment is not clearly revealed in the EIA report, which mentions topics taken up in various groups but does not include any examples of impact on the actual EIA procedure. In the Ministry's view, the report should have revealed the results of participation and their impact on the environmental impact assessment, and the choice and selection of participants should also have been recorded in the report.

When the assessment report was finalised, the MEE published a public notice, made the report available and invited various authorities to comment on the report. The statement on the EIA report, prepared by



the MEE in its capacity as contact authority, will be delivered to the municipalities in the affected area and to the appropriate authorities.

At the report stage, Norway, Sweden, Lithuania, Estonia and Austria participated in the procedure under the Espoo Convention. A public hearing was arranged in Tallinn, Estonia. The comments by Lithuania, Norway and Estonia include questions that the countries in question would like to receive replies to in writing. Furthermore, Austria requested a consultation and replies, in writing, to questions it presented. The consultation meeting was arranged in Helsinki on 26 May 2008, and Austria submitted its final statement on 11 June 2008, including recommendations for Finland mainly regarding the source term of a serious accident.

The Ministry of Employment and the Economy states that replies will be provided in writing to the questions by Lithuania, Estonia and Norway. Moreover, Finland will separately review the recommendations of Austria submitted in the consultation process under the Espoo Convention, and reply to Austria.

#### 4.6 Assessment report (reporting) and submission of application for a decision-in-principle on 25 April 2008

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.

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

The contact authority's statement by the Ministry of Trade and Industry does not consider it appropriate that an EIA report and an application for a decision-in-principle would be presented for comments at the same time, since they relate to the same project. The Ministry expressed the wish that the contact authority would be able to submit the EIA report for comments and provide the contact authority's statement before submission of the application for a decision-in-principle to the Government.

The Ministry of Employment and the Economy's deadline for comments was 21 April 2008, by which date, however, several authorities, organisations and private persons had requested an extension for submitting comments and opinions. The Ministry of the Environment and Austria were the last to submit comments, on 4 June 2008 and 11 June 2008 respectively.

On 25 April 2008, TVO submitted to the Government an application for a decision-in-principle on the construction of the Olkiluoto 4 nuclear plant project. On the same day, Posiva submitted an application for a decision-in-principle on the final disposal of spent fuel generated by the Olkiluoto 4 plant. Hence TVO failed to comply with the recommendation by the Ministry of Trade and Industry. This is regrettable in the Ministry's

view, because two procedures underway at the same time concerning the same project can result in confusion.

#### 4.7 Summary and adequacy of the assessment report

The MEE finds that the EIA report of the Olkiluoto 4 nuclear power plant unit meets the content requirements of EIA legislation and has been handled in the manner required by the legislation. The Ministry finds the EIA report essentially adequate, but certain topics require further clarification before the consideration of the application, submitted by TVO on 25 April 2008, with a view to arriving at a decision-in-principle, can commence regarding the application's essential parts.

The comments submitted consider the report to be, in the main, appropriate and comprehensive. However, for instance the Ministry of the Environment, the Regional Environment Centre of Southwest Finland, and the Radiation and Nuclear Safety Authority STUK suggest that certain parts of the EIA report are defective.

Therefore, the Ministry of Employment and the Economy considers that the issues presented hereafter need more precise examination in a supplementary report, due to the Ministry by 31 August 2008. The Ministry of Employment and the Economy will attach the report submitted to it to the comment request material of the application for a decision-in-principle on the Olkiluoto 4 project. However, the schedule of the required Natura assessment can deviate from this schedule, and that assessment will be conducted separately in accordance with the Nature Conservation Act.

The supplementary report to be prepared shall handle at least the following topics:

- Cooling water issues; more specific assessment of the environmental impact of the embankment to be constructed. Furthermore, an assessment shall be provided on how the cooling water models would have presented the impact without the embankment. The licensing procedure for the embankment must also be included.
- A more detailed presentation of the various plant type alternatives is required, with a review of key technical information regarding the environmental impact of the plant alternatives included in the application for a decision-in-principle on Olkiluoto 4, submitted on 25 April 2008.
- The Natura site of the Rauma Archipelago (FI02000073) shall undergo a Natura assessment pursuant to section 65 of the Nature Conservation Act, according to a separate schedule.
- A more specific presentation of the methods used for accident reviews. The supplementary report must also include a short assessment of the environmental impact of an accident less serious than the serious reactor accident presented in the EIA

report, e.g. an accident in categories 4-5 on the INES Scale of the International Atomic Energy Agency IAEA. Replies must be provided in writing to questions posed by Lithuania, Estonia and Norway, pertaining to the assessment of international impact, and the replies must be translated into English.

- A more precise assessment is required on the employment effects of the project, including a review of the regional and broader employment effects on the basis of experience gained from the Olkiluoto 3 project.

Furthermore, TVO can, should it so wish, also handle other questions brought up in this statement.

## 5 COMMUNICATING THE STATEMENT

The Ministry of Employment and the Economy will deliver the statement on the EIA report to those authorities which have submitted comments. The statement will also be available on the Internet at [www.tem.fi](http://www.tem.fi)

The Ministry will send copies of the comments and opinions concerning the assessment programme to the organisation responsible for the project. All comments and opinions received by the Ministry are published on the Internet.

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

Mauri Pekkarinen  
Minister of Economic Affairs

Jorma Aurela  
Senior Engineer

## DISTRIBUTION

Authorities having submitted comments