

Slovenia's energy policy targets are set by the Energy Act, the Resolution on the National Energy Programme, various international agreements and EU directives. The main objectives have been reached as presented below:

Legal basis	Target	Value	Comment
Directive 2001/77/EC	33.6% in 2010	34.4% in 2010	102% achievement
Directive 2006/32/EC	4 261 GWh (9%) of energy savings by 2016; 1 184 GWh (2.5%) by 2010	1 174 GWh by 2010	99% achievement – intermit target
Kyoto protocol	-8% 58 734 ktCO ₂ in 2008–2012 in non ETS sector (11 747 ktCO ₂ /yr)	+11 460 ktCO ₂ e 2009	on the planned pathway

The reason for the delay in reaching the targets is the late start in implementing the measures.

In the final version of the NEP, the chapter on reaching the targets will be amended according to new statistics from 2009 and 2010.

In the draft National Energy Program (NEP), specific sets of activities are foreseen (within 17 sector-specific, multi-sectoral and horizontal sub-programmes), including financial incentives and funds for sustainable energy options.

The progress achieved in the last years in the areas of energy efficiency (EE) and renewable energy sources (RES) assures a solid basis for future actions. Recently the main achievements have been:

- renewal of RES electricity and a combined heat and power (CHP) support scheme (2009),
- financial support for EE and RES heating in public buildings through the EU Cohesion fund (implemented since 2010), and
- new energy saving schemes (2009).

The NEP also includes the necessary financial, organisational, management and monitoring measures to ensure that its targets will be reached.

a) What were the reasons for Slovenia not reaching several targets which were defined in the former energy policy?

S. Renner – has the introduction to the NEP been corrected?

b) How can it be ensured that the new targets will be reached?

Questions raised by Austria 2) Scenarios of the NEP	Slovenian answers
<p>a) Until which year should the operational lifetime of Krško NPP be extended?</p> <p>b) What potential of energy-efficiency measures and the use of RES will be exploited with the measures in the different scenarios and what technical and economically feasible potential remains unexploited?</p> <p>What factors are affecting the decision on the new NPP (mentioned in the NEP)?</p> <p>Why is there no scenario without nuclear option?</p>	<p>According to the draft NEP, the operational lifetime of the Krško NPP is to be extended by 20 years, until 2043. Continuation of its operation is conditional on favourable outcomes of Periodic Safety Reviews, which are conducted every ten years. According to international and EU recommendations, the continued operation of the existing Krško NPP will be an EIA matter and Austria could get more technical information at the EIA stage.</p> <p>The draft NEP includes a strategy for intensive RES and EE promotion, with a variety of measures including substantial financial support.</p> <p>In all scenarios of the NEP, based on the intensive strategy, the expected effects by 2030 are:</p> <ul style="list-style-type: none"> - Electricity savings in the amount of 2.1 TWh relative to the scenario without additional policies and measures; - Additional 4.6 TWh from distributed electricity generation units based on RES or high-efficient CHP; - Additional 2.6 TWh from large-scale hydro power plants (560 MWe); - Additional 0.9 TWh of electricity from large-scale highly efficient CHP. <p>Some economic and technical hydro and wind potential remains not acceptable due to environmental reasons, for example the Natura 2000 habitat assessment and protected areas (i.e. parts of the Mura and Soča rivers; all potential wind locations in protected areas).</p> <p>EE measures are planned according to the expected availability of financial resources at end users (e.g. it is assessed that policies and measures result in 4% of buildings being renovated annually).</p>
<p>Timing and capacity of Mura HP. Will protected areas be taken into account (on the border area)?</p>	<p>The chain of 6(9) was assessed as not acceptable; the remaining potential ranges from 1.5 to 55 MW: from the border at Ceršak to the Vučja vas motorway bridge.</p> <p>Timeframe for activities related to HP Mura: 2018–2030; all protected areas on both sides of the border will be taken into account in the SEA and habitat directive assessment process.</p> <p>A state spatial plan will be developed for these projects; a Commission has already been established and will serve as a common body for trans-border discussions to reach common goals in the border area.</p>

Slovenian answers	
3) The Slovenian electricity market and exports of electricity	
<p>a) <i>How will it be ensured that the enhancement of transmission capacities to neighbouring countries will be financed by the beneficiaries of these measures, which are the electricity-exporting companies?</i></p>	<p>The draft NEP includes necessary measures to charge electricity producers with a part of the costs of operation/construction of the electricity transmission and distribution networks (except for RES and high-efficient CHP), proportional to the size of production unit. The necessary legislative acts to be adopted are included in the NEP.</p> <p>These producers shall bear particularly the following costs:</p> <ul style="list-style-type: none"> - All disproportionate costs caused to the system, particularly the costs of providing system services and network-related costs; - Costs related to additional reserve capacities <ul style="list-style-type: none"> o according to the NEP, the transmission system operator (TSO) may impose an obligation on project holders to provide for the tertiary control reserve, while taking into consideration the disproportionate costs incurred by the unit for the system; - The costs of interconnectors to the existing network are part of the power plant construction projects, both organisationally and financially.
<p>b) <i>What investments into the transmission grid would become unnecessary if Krško NPP2 were not to be built?</i></p>	<p>The priorities for further development of the electricity transmission network in Slovenia are</p> <ul style="list-style-type: none"> - Construction of internal connections (completion of an internal loop to a 400-kV network by installing the Beričevo–Krško power line); - Strengthened connections with neighbouring countries (Hungary and Italy); - Strengthening of the 110-kV network due to expected growth of decentralised electricity production. <p>The connection with Hungary and enhanced connection with Italy are not interlinked and not conditional on construction of Krško NPP2. The connection with Italy (Udine Ovest (IT)–Okroglo (SI)) is one of the Trans-European Energy Networks projects.</p>
<p>c) <i>What generation capacities would be sufficient for Slovenia if the National Energy Programme did not intend to increase electricity exports?</i></p>	<p>The NEP aims to balance simultaneously environmental, supply security and competitiveness objectives. Planning of diversification of the energy mix is one of the objectives of the national energy policy according to the Energy Act. At the same time, the main energy policy objective is reduction of environmental burden and long-term transition to low-carbon sources, thus to maximise energy efficiency and renewable energy use. The NEP target is to reach 40% share of electricity generation from RES in gross final electricity consumption by 2020 and 53% share of RES-E by 2030.</p> <p>The Slovene power system is relatively small, so an orientation towards adequate diversification of the energy mix for electricity generation (sources, locations and technologies) results in excess capacities in certain transition periods.</p> <p>Export of excess electricity is a side-effect of diversification strategy, not a goal.</p> <p>50% of NPP production is exported to Croatia; to cover domestic needs Slovenia has been importing for the last five years or so.</p> <p>National supply of electricity becomes nonsensical in the common EU market.</p>

Questions raised by Austria	Slovenian answers
<p>d) Which part of the new NPP's production would be exported?</p>	<p>See previous answer.</p>
<p>4) Transmission system and reserve capacities</p>	
<p>a) Is it guaranteed that the capacity of the new NPP will be compatible with the national grid? What analyses have been performed?</p>	<p>Yes, it is guaranteed that the capacity of the new NPP will be compatible with the national grid. Milan Vidmar Electric Power Research Institute, ELES national grid operator and GEN have performed an analysis for transport of electricity and a grid stability analysis that demonstrated the new unit can be connected to the existing grid and the planned grid upgrades.</p> <p>Relevant studies:</p> <ul style="list-style-type: none"> - The Inclusion Possibilities of JEK2 with Power of 1600MWe or 2x1100MWe into the Slovenian Power Transmission Grid, EIMV – Milan Vidmar Electric Power Research Institute, December 2009; - The Inclusion of New NPP JEK2 into the Slovenian Power Transmission Grid, EIMV – Milan Vidmar Electric Power Research Institute, April 2008; - Power System Development Strategy of the Republic of Slovenia, Development Plan of Transmission Grid in Slovenia from 2011 to 2020, ELES, May 2011; - Optimal Scenarios for Covering Electricity Consumption in Slovenia with Production Sources, Effect of New NPP on Electricity Production System in Slovenia, EIMV – Milan Vidmar Electric Power Research Institute, August 2007.
<p>b) What additional secondary and tertiary reserves will be necessary for Slovenia when the biggest unit in the ELES control area is the 1000 MW nuclear unit of Krško NPP2? Why build big power plants if the NEP states that smaller capacities are clearly better?</p>	<p>Autonomous operation of the electricity system for emergency operation will be ensured through adequate production and reserve control capacities in accordance with ENTSO-E rules.</p> <p>According to the UCTE/ENTSO-E operational handbook, a fixed share of 50% of the total needed secondary control reserve plus tertiary control reserve must be kept inside the control area.</p> <p>According to the NEP, it is expected that 550 MW for tertiary control reserve will be available in Slovenia before 2016. Also, it is expected that 100% of the secondary control reserve is going to be kept geographically within the control area (current capacities are adequate). This means that in the case of a new 1 000 MW unit in Krško, Slovenia will need an additional 450 MW for tertiary control reserve.</p> <p>As regards diversification of sources, this is a political decision.</p>
<p>c) What investments in additional reserve capacities are necessary and who will have to cover their costs?</p>	<p>See answer Q3.</p>

Questions raised by Austria

5) Independence of the Assessment of Environmental Acceptability

Slovenian answers

According to the Environmental Act, the SEA Report is prepared by any private company with a certificate issued by the Slovenian Environmental Agency. The competent authority (Ministry of Environment and Spatial Planning) checks the quality of this report in consultation with other authorities responsible for certain environmental matters: the Institute for Nature Conservation, the Slovenian Environmental Agency, the Ministry of Culture and the Ministry of Agriculture, Forestry and Food. In this particular case, two improvements to the SEA Report were made in the fields of nature conservation and water. The quality of the SEA report was then confirmed. The Environmental Acceptability Decision is a formal act issued by the competent authority after public (within Slovenia) and trans-boundary consultations (when necessary) are concluded.

Are there any plans to assess the economic rationales of an extension of the operational lifetime of the Krško NPP and the construction of Krško NPP2 and the ecological impact of these measures by an independent organisation to provide both the public and the decision-makers with impartial information about the benefits and costs of nuclear energy to their community?

The assessment of environmental acceptability within the SEA report of the sub-programme 'nuclear energy' applies the methodology of evaluation of external costs arising from the environmental impact of electricity production in the EU (EN35 External Costs of Electricity Production¹).

The study ordered by GEN energija d.o.o was taken into account only to assess the magnitude of local impacts of the existing NPP on surface water (cooling system) and on ambient air due to emissions.

Following EN35 methodology, external costs from nuclear facilities in the SEA Report reflect to a large extent the amounts of emissions of CO₂, air pollutants and radioactive substances (primarily from downstream radioactive emissions from mine tailings along with a minor portion from operation of the plant itself). Taking into account only low air pollutant and CO₂ emissions, and the level of non-accident-related radioactivity, external costs of extension of the operational lifetime of the Krško NPP and construction of Krško NPP2 are considerably lower than those of fossil fuel generation and broadly equivalent to renewables.

Regarding quantification of nuclear accident impact, there is currently no accepted method on how to include potential environmental impacts of severe accidents and nuclear events in such an analysis at the SEA stage.

¹ ExternE-Pol (2005) Externalities of Energy: Extension of Accounting Framework and Policy Applications, Report to the European Commission DG Research, Technological Development and Demonstration (Contract No: ENGI-CT2002-00609), produced by ARMINES/Ecole des Mines de Paris et al.

Questions raised by Austria

Slovenian answers

A framework for assessing and comparing alternative options of energy sources is given by the sustainable development concept of three pillars – society, economy and environment. In the energy and electricity sector, scientists and experts established robust approaches and selected relevant sets of indicators. Following the set of technology-specific indicators of Hirschberg et al.,² two indicators are taken into considerations:

- the environment indicator: impact on human health assessed by the indicator 'mortality due to severe accidents and nuclear events';
- the social indicator: risk aversion regarding the probability of a future accident and nuclear events assessed by the indicator 'maximum credible number of fatalities per accident'.

Mortality due to severe accidents and nuclear events

The basis for the indicator 'mortality due to severe accidents and nuclear events' is ENSAD (the Energy-Related Severe Accident Database).³ ENSAD is a comprehensive database on severe accidents with emphasis on the energy sector for OECD countries (the Chernobyl nuclear accident is not included). Owing to the considerable differences in design, operation and emergency procedures of the Chernobyl plant, the Chernobyl-specific results are not relevant for OECD or most non-OECD countries.

From the graph of the frequency–consequence curves which represent curves of 'Frequency of events causing X or more fatalities per GWe.year',⁴ it can be seen that:

- for LPG, the frequency of events causing 100 or more mortalities is about $6 \cdot 10^{-3}$ /GWe.year;
- for coal, oil and natural gas, the frequency of events causing 100 or more mortalities is about $4 \cdot 10^{-4}$ /GWe.year;
- for nuclear energy, the frequency of events causing 100 or more mortalities is about $1 \cdot 10^{-5}$ /GWe.year.

² Hirschberg, Dones, Heck, Burgherr; Schenler and Bauer (2004) Sustainability of Electricity Supply Technologies under German Conditions: A Comparative Evaluation, PSI report, No. 04-15, Paul Scherrer Institut, Villingen, Switzerland.

³ OECD (2007) Risks and Benefits of Nuclear Energy, NEA No.6242.

⁴ Figure 'Comparison of frequency–consequence curves for full energy chains in OECD countries for the period 1969–2000', from OECD (2007) Risks and Benefits of Nuclear Energy, NEA No.6242.

Questions raised by Austria

Slovenian answers

Maximum credible number of fatalities per accident

The need to explicitly reflect risk aversion in the assessment of consequences from severe accidents has been recognised in a majority of recent studies on the assessment of energy systems. This necessity results from discrepancy between the social acceptability of a risk and estimated values of damages caused by severe accidents to humans and environment. When an assessment is made using external costs (expressed by monetary value or otherwise), risk aversion can be integrated into the evaluation of the external costs of severe accidents through a special risk coefficient or by adding a special risk value to external costs.

Inclusion of potential environmental impacts of severe accidents and nuclear events into the SEA Report

Within the external cost-estimation framework (applied by EN35 methodology), nuclear energy exhibits the lowest total costs. However, nuclear energy's ranking in the framework of the above-mentioned studies tends to be lower, mainly due to consideration of a variety of social aspects not reflected in external costs of EN35 methodology. Thus nuclear energy mostly ranks lower than renewables: top performance is attributed to hydro and wind, followed by nuclear and gas, while the worst ranking is for coal and oil.

With subsequent amendments to the SEA Report, the potential environmental impacts of severe accidents and nuclear events shall be included by:

- adding to the assessment of impacts on human health the contribution of the potential impacts of severe accidents and nuclear events using the indicator 'mortality due to severe accidents and nuclear events';
- adding to the assessment of impacts on material assets the contribution of the risk aversion to the devaluation of material assets (property in the vicinity of nuclear facilities).

Tables from 44 to 51 of the SEA Report will be changed accordingly.

The changes due to inclusion of potential environmental impacts of severe accidents and nuclear events into the SEA Report are evident in the case of Table 44: 'Scenario BAS_INT (OSN_INT)'.

Slovenian answers	
6) Nuclear power capacity in Slovenia	
<p>Is it guaranteed that the capacity of the new NPP will be compatible with the national grid? What analyses have been performed? What part of the new NPP production would be exported?</p>	<p>See answers Q3 and Q4.</p>
7) Lifetime extension of the Krško NPP	
<p>a) To what extent will the WENRA safety objectives for new power reactors, and the WENRA position papers on key issues, which are being elaborated at present, be taken into account in the licensing procedure for lifetime extension of the NPPK?</p> <p>WENRA has also a chapter for existing plants, not only new ones (document from Dec 2010).</p> <p>b) Is it planned to postpone further steps in the context of NPPK lifetime extension until the results of the European 'stress test' (including the conclusions of the peer review) are available?</p>	<p>The WENRA Safety Objectives for the new plants were prepared for the new plants and are to be applied in existing power plants as far as is reasonably practical. For the existing plant, the WENRA Reference Levels are applicable. Slovenia is one of the first countries that has fully harmonised its legislation with WENRA Reference Levels and has them fully implemented in the Krško NPP.</p> <p>In addition, during the preparations for the operating lifetime extension, all reasonable efforts were made to incorporate any new requirements. This was especially intensified after the Fukushima event and in the scope of EU Stress Tests implementation. Wherever it is possible, primarily in the scope of Periodic Safety Reviews, the Safety Objectives for the new plants will be taken into account to the maximum reasonable extent, focusing on decreasing the gap between the objectives and actual design.</p> <p>The process of approval of technical aspects of lifetime extension is proceeding in parallel with the Stress Tests evaluation. Of course, any resulting Action Plans have to be implemented after this.</p>

Slovenian answers

Questions raised by Austria

<p>c) <i>What ageing management activities took place at NPPK before the new AMP was implemented after 2005?</i></p>	<p>During the first Periodic Safety Review, it was recognised that a systematic approach to AMP was not in place. However, NEK had various existing programmes for ageing-management control, which followed internationally recognised codes and standards and applied state-of-the-art methods and techniques. Existing programmes addressed a largely comprehensive set of safety-significant structures, systems, components and ageing mechanisms throughout the plant. It was therefore concluded that NEK ageing-management programmes did support the safe operation of the plant, but that more systematic system of AMP should nevertheless be implemented.</p> <p>NPP Krško had a majority of activities required by AMP programmes in place even before the AMP process started. In accordance with the NRC 10CFR54 regulation and NUREG 1800, some additional systematic approaches and programmes had been developed and put into practice.</p>
<p>d) <i>Are there specific challenges at NPPK the AMP is focussing on – systems, structures or components requiring special attention?</i></p>	<p>The whole process of preparing AMP and conditions for lifetime extension was so complex that it is hard to select the most challenging part. During the next refuelling outage in spring 2012, several modifications related to environmental qualification of equipment will be implemented as the last condition for the approval of technical aspects of lifetime extension.</p>
<p>b) Construction of a new nuclear power plant in Krško (Krško NPP2)</p>	
<p>a) <i>What safety standards would apply to the new NPP project, in particular concerning the avoidance of accidents with large or early releases?</i></p>	<p>The basic design conditions for any nuclear facility are prescribed in the Rules on Radiation and Nuclear Safety Factors (JV5). Detailed safety standards to be applied for the new NPP project have not yet been prescribed. It is left to the investor to come to the regulatory body with a proposal as to which standards to apply. The regulatory body will have the option to review and agree or reject them as a design basis.</p> <p>Of course, the WENRA safety objectives for new nuclear reactors will also have to be taken into account.</p> <p>Slovenia is following all WENRA safety objectives. Internationally agreed objectives and standards are very important for Slovenia as a small country.</p>
<p>b) <i>How will it be guaranteed that the SNSA has sufficient resources available for the licensing procedure for a new NPP? Are concrete activities already underway?</i></p>	<p>Some analyses regarding necessary additional resources have already been prepared (see the article Human Resources and Technical Knowledge Analysis Needed for the Licensing Process for the New Nuclear Build: The SNSA Approach, presented at the conference in Portorož 2010, http://www.djs.si/proc/port2010/pdf/1206.pdf). However, since the project of the new NPP is currently on hold, the SNSA has also stopped preparations.</p> <p>The current estimate is that about 20 more people are needed in the case of NPP2.</p>
<p>c) <i>What conditions and business decisions will be relevant to take the decision to build a new unit at NPPK?</i></p>	<p>The long-term deployment of nuclear energy at the Krško site as part of the Slovenian energy mix is found to be justified and in line with all goals set for the National Energy Programme. As such, long-term retention of nuclear electricity production at Krško is assumed in the NEP. The basic question for the industry today is what to build, how much and when, given the long life of capital assets and high sunk costs, increasing competition – despite heterogeneous implementation of the Directives so far – against a background of global environmental concern. The key to all outcomes will be competitiveness, security of supply, environmental impacts, fuel availability and strong balance sheets, which will also determine which technologies can thrive.</p>

Questions raised by Austria	Slovenian answers
<p>d) Since the draft NEP proposal makes a reference to the social acceptability of the further long-term exploitation of nuclear energy in Slovenia (pp. 1, 33, 35, 39, etc.), in what way will the social acceptance of the population be included in the decision-making process? Will a referendum decide about the implementation of the project Krško NPP2?</p>	<p>Slovenian legislation is in accordance with EU legislation and directives. Public debate on the project is included during the process of strategic planning and spatial planning acts, the site licensing process and the construction licensing process.</p> <p>Public acceptance is an important part of each project and is taken into account in each process of the project.</p> <p>Slovenia has shown an active approach towards nuclear activities, social responsibility and cooperation. High-level experts from universities and all possible relevant authorities, as well as local communities, have been cooperating on the project for local acceptance of the low-level radioactive waste-disposal location; this means that a bottom-up approach has been followed.</p> <p>Slovenia is also active in the European research on nuclear activity IPPA – Implementing Public Participation Approaches in Radioactive Waste Disposal in International-technical Challenges for Implementing Geological Disposal (7th Research Framework Programme).</p> <p>The final decision for the NPP adoption will be prepared by the Government of the Republic of Slovenia and the Parliament.</p>
<p>e) What indicators will be applied to assess the social acceptability of the project Krško NPP2?</p>	<p>Indicators applied in the SEA Report are not technology-specific and they cannot be applied to assess and compare alternative technological options of nuclear power plants.</p> <p>Before deciding on the construction of a new NPP in Krško, economic, environmental and social benefits and costs will be assessed using indicators which are well developed and widely accepted. An example of the three pillars approach to indicators of sustainable development is the set of indicators in the NEA study (2007), which has the following indicators to assess the social acceptability of the Krško NPP2 project:</p> <ul style="list-style-type: none"> - employment – technology-specific job opportunities; - proliferation – potential; - human health impacts on normal operation – mortality (reduced life expectancy); - local disturbance – visual amenity; - critical waste confinement – necessary confinement time; - risk aversion – maximum credible number of fatalities per accident. <p>By amendments to the SEA Report, the risk aversion due to the potential environmental impacts of severe accidents and nuclear events will be included by:</p> <ul style="list-style-type: none"> - adding to the assessment of impacts on material assets generated by the risk aversion (the devaluation of material assets in the vicinity of nuclear facilities).

Slovenian answers	
Questions raised by Austria	
9) Disposal of low- and intermediate-level radioactive waste (LILW)	
<p>a) <i>What is the reason for the apparent discrepancy regarding the completion of the LILW repository between the CNS Report 2010 and the draft NEP proposal of 2011?</i></p>	<p>Preparatory activities for the LILW repository are in progress; the national spatial plan for the LILW repository location was adopted in 2009. We are aware that it will be practically impossible to achieve the 2013 milestone from the Nuclear Act (ZVISJV). This is the main reason for a difference in the two documents.</p> <p>The draft NEP proposal provides only an inactive target year for completion of the LILW repository.</p> <p>Slovenia is looking for an agreed solution with Croatia on the LILW repository and for this reason a potential change of the previous national target year is also under discussion in the framework of NEP decisions.</p> <p>At the moment, we have reserved a site for half of the LILW near the NPP Krško (50 m underground, below the aquifer).</p> <p>The timeframe for completion of the LILW repository in the NEP will be changed according to the political consensus achieved.</p>
<p>b) <i>What are the present funds available and what is the share of public funds for the construction of the LILW repository?</i></p>	<p>Gen energija is paying on a monthly basis a contribution to the Slovenian decommissioning fund for the amount of electricity taken by the Slovenia power grid. As per 30 June 2011, the accumulated funds amounted to EUR 154 512 986. There is no public share in funds for the LILW. Croatia is also collecting funds in a special fund and official information from their Ministry shows that as per 31 December 2010, the Croatian accumulated funds amounted to EUR 109 165 017.</p>
10) Disposal of high-level radioactive waste (HLW)	
<p>a) <i>What protection does the fuel-handling building provide for the spent fuel pool, in case of external events (e.g. aircraft crash)? Is this protection equivalent to that provided by the reactor building?</i></p>	<p>The protection of the spent fuel pool is different from the protection of the reactor building. Some information is available in the National Report on Stress Tests. But most of the information is of a confidential nature and could not be made public.</p> <p>The seismic capacity of the spent fuel building is of the same level as that of the main nuclear island.</p>

Questions raised by Austria	Slovenian answers
<p>b) Any generator of electricity needs to have a permanent solution for dealing with the accumulated waste. What are the envisaged solutions for the high-level waste in the Krško NPP? What are the expected costs for a permanent storage of this high-level waste?</p>	<p>The National Strategy on Radwaste Management (http://zakonodaja.gov.si/rpsi/r02/predpis_RESO42.html) foresees that the spent fuel remains in the spent fuel pool of the plant until the end of its operational life. Several years later it should be transferred into dry storage (in casks) and left there for about 35 years. Only after that period should Slovenia look for a permanent solution if such does not emerge sooner. Slovenia hopes that some day it will be possible to share the costs and burden of high-level disposal on a regional or global basis.</p> <p>After the Fukushima event, the possibility of shortening of the wet storage period is being considered.</p> <p>The cost for high-level waste disposal represents a considerable part of the levy which is being paid to the decommissioning fund.</p> <p>The decommissioning plan was made and is publicly available.</p> <p>One of the options is to reprocess the spent fuel, thus reducing the volume of HLW to 5%, and to use the rest of the material as a fuel in NPP2 (or to export this fuel).</p>
<p>c) With which state does the Republic of Slovenia intend to find a bilateral solution to the permanent disposal of radioactive waste?</p>	<p>Regarding the disposal of LILW, the solution has to be found with Croatia, the co owner of the Krško NPP.</p> <p>For the high-level waste disposal, it remains to be seen what will transpire, in accordance with national strategy.</p> <p>The new EU directive is fostering a multi-national solution.</p> <p>A regional solution is currently unrealistic (a NIMBY symptom).</p>
<p>d) Will the expected costs of a permanent storage of high-level radioactive waste be internalised in the price of energy as is formulated as a 'key element in the transition to sustainable energy options' in the draft NEP proposal?</p>	<p>The costs are already internalized.</p> <p>Slovenia (Gen energija) is paying for the time being a contribution of 3EUR/MWh for electricity taken by the Slovenian owner of the Krško NPP. With a revision of the decommissioning plan, this amount will increase.</p>

Questions raised by Austria	Slovenian answers
<p>e) What plans or concepts are there at present for the storage of spent fuel (to the extent it is not reprocessed) – regarding amounts, site(s) and periods of time? In particular, how will the time period 2023–2043 be bridged? Is increasing the density of the storage considered as an option? Is it planned to postpone further steps regarding the planning of spent fuel storage until the results of the European ‘stress test’ (including the conclusions of the peer review) are available?</p>	<p>NEK performed all required safety analyses in 2002 for the extended lifetime operation until 2043. The first phase of the re-racking was done at that time. Implementation of the second phase of SFP re-racking allows NEK to operate and store SF until 2043. The Decommissioning Plan predicts options for long-term SF storage and handling. The final decision of Phase 2 for re-racking has not yet been reached, partly due to the request of the SNSA to investigate all possible long-term solutions for SF storage at the site.</p>
<p>f) How much of the spent fuel is expected to be reprocessed – in which facility? Where would the reprocessed waste be stored?</p>	<p>Spent fuel management is defined by the current valid document ‘The National Strategy on Radwaste Management’ (http://zakonodaja.gov.si/rpsir02/predpis_RESO42.html). Currently the accepted strategy for spent fuel handling is based on a deferred decision. A decision will be made among several options; reprocessing is one of the options. We do not have any action plan to reprocess the fuel at this time.</p>
<p>g) How does the Government of the Republic of Slovenia intend to fulfil the requirements of the radioactive waste and spent-fuel management directive? In particular, what are the plans for a permanent disposal of radioactive waste and what are the expected costs and the intended financing schemes for the additional waste generated by an extension of the operational lifetime of the Krško NPP and the construction of Krško NPP2?</p>	<p>After the first screening of our legislation against the new directive, no significant gaps have been determined. The detailed screening will be done in spring 2012 and may result in some changes of rules or ordinances.</p> <p>The additional costs of waste management in the case of lifetime extension of a new NPP will be taken into account in the cost of electricity.</p> <p>But already per existing Slovenian legislation, the price of the electricity from nuclear energy needs to cover all costs for long-term storage and disposal of high-level as well as low- and intermediate-level waste. This is covered by the NPP decommissioning and waste disposal plan, which is revised every 5 years</p>
<p>11) Uranium mining</p>	

Questions raised by Austria	Slovenian answers
<p>Are there any plans for a re-activation of the Žirovski vrh uranium mine?</p>	<p>The Government of Slovenia already accepted the plan for closing the Žirovski vrh uranium mine. There are no plans for re-activation.</p>
<p>12) Funding for the nuclear energy sub-programme</p> <p>a) Are possible updates in the security architecture of Krško NPP included in the estimated costs for the extension of the Krško NPP operational life?</p>	<p>The high level of safety and reliability of the Krško NPP is the result of the permanent plant upgrade process. Safety upgrades, which were planned before stress tests, are all included in estimated costs for the extension of the Krško NPP operational lifetime and are also included in the cost of electricity produced by the Krško NPP. Additional costs resulting from stress tests will be included in the annual budget and business plans and will be also included in the cost of electricity produced by the Krško NPP.</p>
<p>b) What are the estimated overnight investment costs for the extension of the operating lifetime of the Krško NPP and for the construction of a new reactor in Krško?</p>	<p>Estimated overnight investment costs for the extension of the operating lifetime of the Krško NPP are around 360 EUR₂₀₀₈/kW and for the construction of a new reactor in Krško around 3675 EUR₂₀₀₈/kW.</p> <p>These data are taken from two studies: one by Electro Institute Milan Vidmar on economic and environmental aspects of NPP lifetime extension (2007) and the other by the International Energy Agency/Nuclear Energy Agency on projected costs of generating electricity (2010).</p>
<p>c) Which discount rate was used for calculating the cost estimation in the draft NEP proposal?</p>	<p>Economic indicators have been evaluated considering a 7% discount rate for all investment costs. In the underlying analysis for the assessment of feasibility of projects, sensitivity analysis has also been carried out. Inclusion of the project in the NEP does not replace further economic analysis for a future business decision.</p> <p>Investment figures in the draft NEP are given without financing costs.</p>

Questions raised by Austria	Slovenian answers
<p>d) What direct or indirect subsidies in the form of loan guarantees, caps on liability resulting from an accident or attack, socialisation of costs and delivery risks associated with managing nuclear waste, etc. are currently provided to the operator of the Krško NPP?</p> <p>Are there discussions about getting a state guarantee for a bank loan for NPP2?</p>	<p>The Krško NPP does not have any direct or indirect subsidies as mentioned in the question. These risks are covered by insurance, and all related costs are included in the cost of electricity produced by the Krško NPP.</p> <p>With respect to state interventions, let us emphasise that Slovenia, in its newly adopted TPL Act, strictly follows the Paris/Brussels Conventions and introduces the so-called second tier, which represents the State liability for nuclear damage if it exceeds the amount of the operator's liability. The third tier is an 'international fund' of all Contracting Parties to the Brussels Convention.</p> <p>In 1974, the NPP was built with a state guarantee. The loan was fully repaid years ago.</p> <p>For the time being there are no plans for a state guarantee.</p>
<p>13) Externalities and the low-carbon society</p> <p>To what extent does the environmental report take into account the waste, decommissioning and risk-related costs of nuclear power and internalise them in the electricity prices?</p>	<p>According to Slovenian legislation, costs of radioactive waste management and of decommissioning of nuclear facilities are internalised in electricity prices.</p> <p>Nuclear facilities are liable to pay a special levy to the Fund for Financing Decommissioning of the Krško Nuclear Power Plant and Disposal of Radioactive Waste from the Krško NPP.</p> <p>Risk-related costs of nuclear power are also partly internalised in the electricity prices through the insurance rate paid by the Krško NPP (see answers to Question 14: 'Nuclear Liability').</p> <p>No external costs for nuclear risk-specific costs are included in the estimates given by the present version of the SEA Report. The European Environment Agency to evaluate the 'EN35' indicator for external costs of electricity production.</p> <p>The SEA Report will be amended or an additional explanation will be prepared about potential environmental impacts of severe accidents and nuclear events.</p> <p>Probabilities for various scenarios will be compared (i.e. nuclear vs. fossil). The actual damage done is impossible to evaluate at this stage.</p>

Slovenian answers	
<p>Questions raised by Austria</p> <p>14) Nuclear liability</p> <p>a) Are any reserves in the budget of the Republic of Slovenia dedicated to compensations in case of a major accident if the damages exceed the capped liability of nuclear operators? Can the Republic of Slovenia afford a nuclear accident the size of Chernobyl or Fukushima?</p> <p>b) What impacts on the Republic of Slovenia must be expected in case of a severe accident in a Slovenian NPP and what would be the impact on the country's economy and society?</p> <p>c) What are the strategies of the Government of Slovenia for coping with the economic consequences of a nuclear accident and the compensation of victims of such an accident?</p>	<p>The 'Third Party Liability' regime in Slovenia is based on the Paris/Brussels Conventions (as revised in 2004, but not yet entered into force) and new Slovene Third Party Liability Act, adopted in September 2010. The national legislation becomes effective after the conventions enter into force.</p> <p>As a rule, the operator of a nuclear installation has to have its liability insured. The State is liable for nuclear damage if it exceeds the amount of the operator's liability.</p> <p>The part of the question asking whether Slovenia can afford a major accident is in our opinion a rhetorical one. Of course any natural or human induced event of such magnitude is not desirable and there are no financial provisions for such foreseen in the current state budget. But it is foreseen that after such an event, the Government and Parliament would decide about allocation of necessary funds.</p> <p>Impact on the country's economy and society depends on the type and specific circumstances of an accident and as such cannot be predicted in advance. As regards nuclear liability, Slovenia is a member of the Paris Regime (Paris 1960 and Brussels 1963) and ratified the Joint Protocol of 1988 and the 2004 Paris Convention which amends the 1960 Paris Convention and the 1963 Brussels Supplementary Convention, like Western European countries.</p> <p>Potential impact is reflected in the National Radiological Emergency Response Plan, revised in 2010 (http://www.sos112.si/slo/tdocs/jedrska.pdf).</p> <p>Regarding compensation of victims in the event of a nuclear accident in Slovenia, the provisions of Paris/Brussels Conventions and the Slovene Third Party Liability Act would apply. The Act provides for the basic rules regarding distribution of compensation (if the damage exceeds the available resources of the operator). The resources of the State would be made available in the Budget of the RS: the amounts and the manner and dynamics of their drawings would be stipulated by a special act based on the assessment of the damage prepared by a special (ad-hoc) commission.</p>