



# DRAFT STRATEGY FOR THE TRANSITION OF SLOVENIA TO A LOW CARBON SOCIETY BY 2050

## Executive summary

### 1. Introduction

The long-term climate strategy or the strategy for Slovenia's transition towards a low carbon society by 2050 is foreseen by the Declaration on the active role of Slovenia in the creation of a new global policy on climate change (Official Gazette RS, no. 95/2009) and the Slovenian Exit Strategy. With the Declaration in November 2009, the Parliament recognised climate policy as a priority and requested the Government to make the transition towards a low carbon society and sustainable development a central goal of Slovenia's Development Strategy 2020. The draft strategy was presented to the public for comment in September 2011. The public debate is scheduled until February 2012, after which it will be submitted to the Government and the Parliament for consideration and adoption.

The Low Carbon Strategy aims at setting the long-term guidelines and framework for combating climate change:

- To define the pathway of greenhouse gas (GHG) emission reduction, that will make the transition to a low carbon society possible,
- To provide for adaptation to the inevitable consequences of climate change.
- Set the responsibilities for planning, implementation and monitoring of climate action,
- Provide the basis, capacity and resources to participate in the development, transposition and implementation of European legislation on climate change,
- Secure economic competitiveness and high quality of life through reducing dependence on fossil fuels, sustainable use of natural resources and green growth,
- Ensure Slovenia's active role in the international community in combating climate change.

For the purpose of this strategy, **low-carbon society**<sup>1</sup> is defined as a society (or economy), whose greenhouse gas emissions are lower than the absorption capacity of the global ecosystem, and is at the same time based on the principles of sustainable development. This means that the purpose of the transition to a low carbon society is reduction of emissions through a new quality of economic, social and environmental development. Emission reduction and adaptation to changed climate require significant structural changes in economy and society at large. Taking into account the past achievements and the strengths and opportunities of Slovenia, a well thought out combination of already known measures, some of which are already being implemented, climate change may represent an important development opportunity.

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<sup>1</sup> Carbon in this expression represents the emissions of all greenhouse gases.

## 2. Goals

Slovenia is a small, open, export-oriented economy with a relatively good educational structure and preserved natural environment. All these represent a relatively favourable starting position for the transition to a low carbon society. **The vision of Slovenia as a low carbon society in 2050 is a highly integrated and inclusive society with an excellent business sector and a high quality of life, space and natural environment.** This vision is consistent with the intended vision and objectives of Slovenia's Development Strategy for the period 2013 - 2020, under preparation by the Government Office for Development and European Affairs.

The strategy of transition to a low carbon society has the following **long-term goals**:

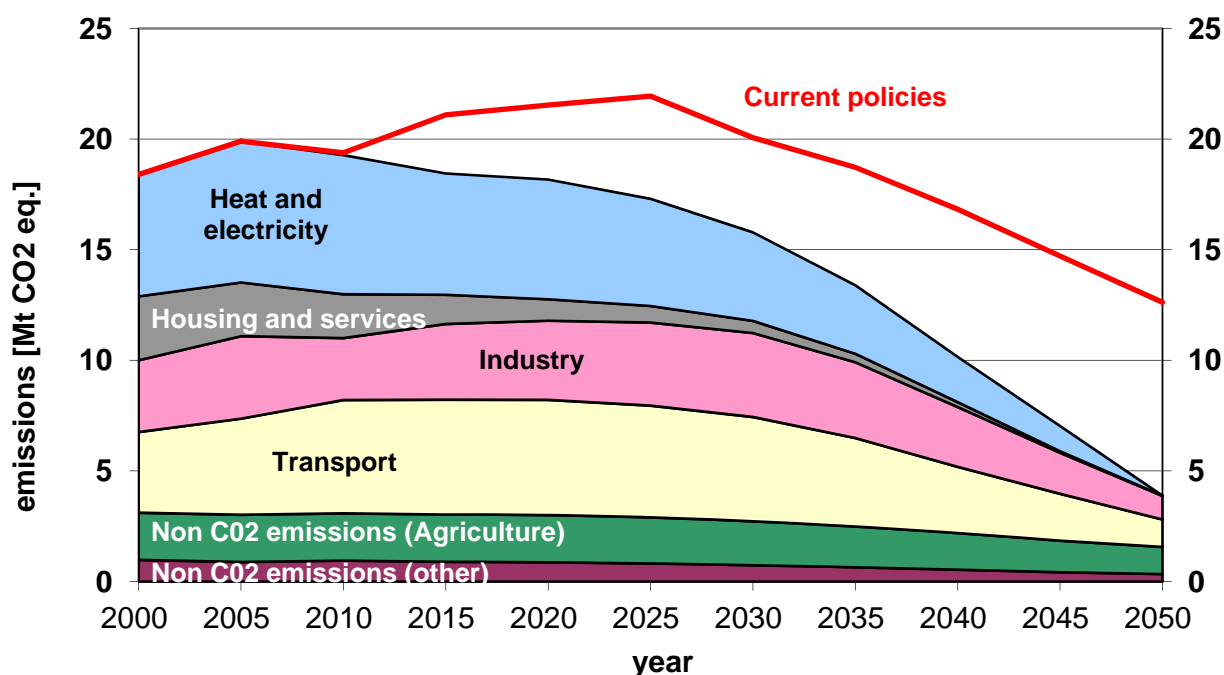
<b>It is the general goal of the state to, in cooperation with other states and respecting the principles of sustainable development, to contribute to halting the increase of global average surface temperature below 2°C compared to the pre-industrial level.</b>	
<b>GHG emission reduction:</b>	<b>Adaptation:</b>
<b>Lower the national GHG emissions to less than 4 million ton of CO<sub>2</sub> equivalent by 2050.</b>	<b>In order to prevent negative consequences of climate change and to reduce the related risks, the long term goal is to adapt to climate change so as to ensure that the vulnerability of Slovenia to the effects of climate change does not increase above present level.</b>

Reducing greenhouse gas emissions to less than 4 million tonnes of carbon dioxide by 2050 is equivalent to two tones of CO<sub>2</sub> eq. per capita annually, which is considered to represent carbon neutrality and reduction of emissions by 80%.

## 3. Pathway

Figure 1 presents the planned cost-effective path for emission reduction until 2050. Except for the transport sector, up to 2030, the pathway is based on the emission projections from the basic intensive scenario of the proposed National Energy Programme (NEP). For the transport sector the path assumes reconstruction of the railway system, accelerated development of public transport and electrification of passenger cars by 2050. After 2030, the pathway follows the logic of the EU 2050 Roadmap (energy sector) and the outcomes of stakeholder workshops (housing and services). The current policies scenario does not include the proposed NEP and the measures in transport, building and other sectors foreseen by this strategy.

**Figure 1: The pathway to reducing emissions of Slovenia by 80% till 2050**

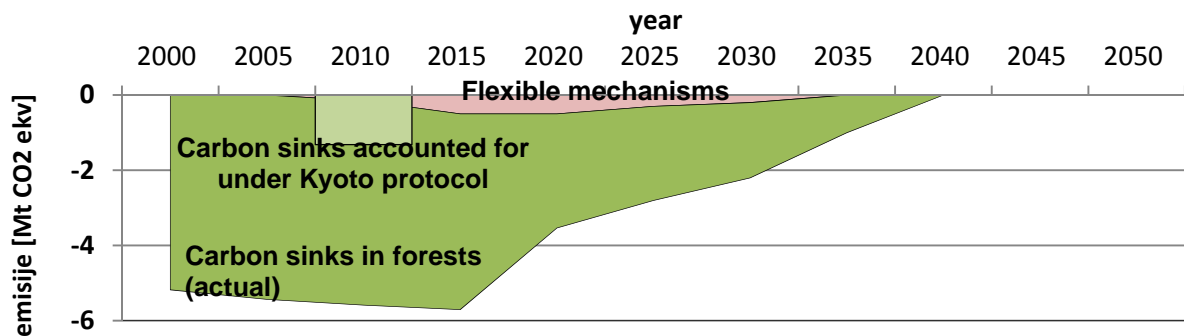


The milestones on this emission reduction pathway are: 10% in 2020 (EU Climate and Energy Package requires Slovenia to reduce emissions by approximately 6%), 22% in 2030 and 50% by 2040 compared to baseline emissions in 1986, without taking into account sinks and flexible mechanisms. This means that Slovenia will reduce emissions at a slower rate than EU as a whole. The main reasons for this are a high share of transport in the GHG emissions (almost 30%) linked with a high share of road transport, and low energy and material productivity of the Slovenian industry. In these two sectors the emissions are projected to grow before they can be reduced.

In addition to domestic emission reductions, Slovenia has two other options to account for emission reductions. In the Kyoto commitment period, Slovenia may account for of 1,32 Mt CO<sub>2</sub> eq. of Carbon sinks related to LULUCF (forests) annually, with the present actual sink being 5,43 Mt CO<sub>2</sub> eq. The future of this possibility depends on the success of international negotiations and the EU regime that will be based on international agreement. In order to preserve the vitality of the forests and use wood as a low carbon material and renewable energy source, the aim is to reduce the sink to zero as soon as possible by increasing the harvesting to the level of the annual increment.

The other options are the flexible mechanisms under Kyoto. Probably, some of these mechanisms will have to be used to comply with the Kyoto targets 2008-2012. Assuming that flexible mechanisms will continue after 2012, the price of carbon from CDM projects will remain below the domestic abatement costs. In view of the importance of such projects for internationalisation of Slovenian economy, 0,5 Mt CO<sub>2</sub> eq. annually should be reduced through these mechanisms between 2015 and 2030. After 2030, these projects should no longer be financially favourable anymore as the developing countries also take on emission reduction targets. The potential of sinks and flexible mechanisms is presented in Figure 2.

**Figure 1: Carbon sinks in Slovenian forests and potential emission reduction through flexible mechanisms.**



Taking into account the assumptions of the EU 2050 Roadmap, the possibility of using carbon sinks and flexible mechanisms Slovenia can fulfil its agreed obligations also in the case of strengthening the EU emissions reduction target for 2020 to -30%. This would also require adequate harmonisation and level of CO<sub>2</sub> taxes in the EU and integration of climate objectives in the EU funding programs.

#### 4. Strategic Approach

The strategic approach focuses on reducing emissions through green growth, adaptation and supporting horizontal strategies that enable the preparation and implementation of other measures:

<b>Emission reduction through green growth</b>	<b>Green Growth</b>
	<b>Green Taxes</b>
	<b>Public Expenditure</b>
	<b>Green Tax Reform</b>
<b>Adaptation</b>	<b>Improving predictions and assessment of vulnerability</b>
	<b>Integration of adaptation objectives into sectoral policies</b>
	<b>Funding</b>
<b>Horizontal strategies</b>	<b>Innovation and Education</b>
	<b>Local and Regional Initiative</b>
	<b>Awareness and Communication</b>
	<b>Active Role in International Community</b>

#### 5. Green Growth

In Slovenia, there are a number of sectors that are already part of or have the potential for **green growth**:

- Energy efficiency including intellectual services, equipment, building insulation and energy efficient buildings.
- Renewable energy including production and installation of equipment (hydro and solar power, biomass, geothermal), their management and maintenance.

- Construction including renovation and energy restoration of buildings, renovation and construction of railways, rehabilitation of road network with the objectives of energy efficiency and the promotion of public transport.
- Metal processing, electronic and electric industry with low-carbon products ranging from components for electric vehicles to smart energy grids.
- Agriculture and forestry establishing supply networks in sustainable food and energy wood. Related health-spa, recreation, catering and tourism that build on natural and cultural heritage of Slovenia.
- Local communities providing local services (including kindergartens, schools, care for the elderly ...) that reduce the demand for transport.

Long-term emission reduction targets and climate security can only be achieved through introduction of new technologies, non-technological, social and entrepreneurial innovation (such as institutional, infrastructural and lifestyle innovation). Strategy therefore assumes an accelerated process of **innovation and introduction of new technologies and approaches into practice**. **Education and training** for green tasks, jobs and careers will contribute to ensuring human resources potential for green growth. Good and participatory **planning at the local level** enables the integration of various sectoral targets and provides multi-functional results. **Awareness and communication activities** will encourage the transition from recognition of climate change as one of the key global challenges to the conscious decision of stakeholders and the general public to plan and implement emission reduction and adaptation measures. **Cooperation with developing countries** will have a positive development and policy impacts for the partner countries and for Slovenia and Slovenian business.

The state will also promote green growth in the following ways:

- through green public procurement,
- through innovative public procurement,
- implementing the concept of "lead markets" and
- through a CO<sub>2</sub> tax exemption scheme for investments in emission reduction.

In addition to the existing **green taxes**, the strategy is based on the increase in revenues from CO<sub>2</sub> taxes and the ETS auctions that will internalise the external costs of emissions in the price of products and services and thereby stimulate emission reductions. Revenues from green taxes (6 to 15% of GDP) are, and will continue to be, several times higher than public spending to combat climate change (1.5 to 2% of GDP) throughout the time of the strategy.

## 6. Climate Change Fund

The Environmental Protection Act provides for a targeted budget of the **Climate Change Fund**, which will be replenished by the 50% of the revenue from ETS auctions from 2012 onwards. In 2013, the Fund is envisaged to amount to 50 million EUR and at the time around the year 2030 it could increase to 250 million with the increase of price of carbon. This fund will enable the implementation of key measures and the mobilization of other public and private funds for investments in emission reduction and adaptation. From the existing sources and the Fund, the country will, in the period to 2050, annually invest public funds in the amount of 300 to 450 million for the following purposes:

- Encouraging investment in renewable energy through the so-called "feed-in" tariffs.
- Investment in public infrastructure and facilities (railways, energy refurbishment of public buildings, energy networks ...).
- Promoting low-carbon investment in the economy (e.g. CO<sub>2</sub> tax duty exemption scheme).
- Social transfers - investment in energy efficiency and low carbon technology by the poorer sections of the population.
- Research, development and innovation in low carbon technologies and social innovation for green growth in the Development and Innovation Strategy of Slovenia (RISS), the deployment and dissemination of these innovations.

- Adaptation to climate change.
- Purchases of emission allowances for the account of the state, as a priority from the clean development mechanism (CDM) projects.
- Aid to developing countries through the mechanisms agreed under the UNFCCC.

## 7. Adaptation

To maintain the vulnerability to the adverse effects of climate change at the present level, in view of the expected increase in exposure, the **adaptation** measures need to increase the resilience and adaptive capacity of society, economy and nature. The increase in resilience can be achieved in the following ways:

- through increasing understanding, predictions, and methods of adaptation,
- by integrating adaptation objectives and measures into sectoral policies, programs and projects,
- through sustainable spatial planning,
- by strengthening the resilience of local communities,
- by providing resources for adaptation measures,
- by raising awareness through training and education.

## 8. Climate Change Act

For the implementation of the proposed strategy, the **Climate Change Act** will be proposed in order to provide the key legal tools to combat climate change:

- Long-term development and investment decisions.
- To allocate the responsibilities and burden sharing for achieving the goals outside the EU ETS in accordance to the Effort Sharing Decision and long-term climate targets.
- Adaptation to impacts of climate change.
- To fulfill international commitments entered into under the Copenhagen and Cancun agreements.
- Regular monitoring of implementation and revision of objectives and actions in terms of performance and experiences, and
- To provide the public access to information on emissions and the risks from climate change.

## 9. Carbon budget

Under the Climate Change Act, an **Operational Programme** will allocate the carbon budget of the country for mid-term periods, representing the sum of permitted emissions for the period according to the Effort Sharing Decision (i.e. outside the ETS), to carbon budgets of individual sectors regulated by respective ministries. Ministries will delegate these obligations through their rules and policies to other subjects or certain groups of subjects within the sector. In the case that the carbon budget is reached through their own actions, or in case of lower cost reductions in other sectors, the ministries will have the option of purchasing emission reductions units (JI or CDM) abroad or carry out joint projects of emissions reductions with other entities Slovenia. Amount and method of allocation of sectoral carbon budgets will be established taking into account cost-effectiveness and feasibility of emissions reductions. At the same time, other indicators serving as a basis for monitoring and reporting will be defined.

## 10. Sectoral objectives and policy guidelines

For specific thematic areas the strategy sets objectives and policies, which are based on existing situation, key policy documents for the respective policy area, and the contributions of participants at the sectoral stakeholder workshops.

Energy (Electricity and heat)	
Objectives	Policy Guidelines
By 2050 reduction of greenhouse gas emissions to zero	<ul style="list-style-type: none"><li>- Implementation of the intensive scenario of the National Energy Programme.</li><li>- Energy efficiency: improving energy efficiency in all sectors, improving energy efficiency in buildings, cogeneration of heat and power (CHP) with high efficiency.</li><li>- The development of smart energy grids, both electricity and district heating.</li><li>- Use of renewable energy sources, in particular: multifunctional hydropower, use of wood or biomass, shallow geothermal energy, utilization of solar energy, limited wind power.</li></ul>
Long-term stabilization of the final demand for electricity	
Zero import of oil and oil derivatives by 2050	
Zero import of coal by 2020	
Transport	
Objectives	Policy Guidelines
By 2050 reduction of greenhouse gas emissions to 1.24 Mt per year	<ul style="list-style-type: none"><li>- Stopping growth in demand for mobility and thereby stopping growth of passenger-kilometres.</li><li>- The absolute priority to public transport, cycling and walking.</li><li>- The gradual construction of rail network and transfer freight to rail.</li><li>- Renovation of road infrastructure to support buses and energy-efficient driving, increase energy efficiency in the construction and management of transport infrastructure.</li><li>- Support the introduction of vehicles with lower emissions and zero emissions of greenhouse gases and other pollutants as well as building smart electrical grid systems and infrastructure to power these vehicles.</li></ul>
Equitable access to mobility for all social groups and geographical areas	
Reducing the number of transit freight road transport	
By 2030 the modernization and construction of the railway network	
Optimization of road networks for public transport, fast, safe and affordable and energy efficient driving	
Introduction of low carbon technologies (LCT)	
Objectives	Policy Guidelines
Development and deployment of low carbon technologies, contributing significantly to the development of the Slovenian economy	<ul style="list-style-type: none"><li>- Promoting sustainable consumption.</li><li>- System approach to the introduction of low carbon technologies, including eco-design, comprehensive LCA approach, stable supportive environment with the timely adoption of regulations, larger pilot and validation projects under public-private partnership.</li><li>- Increase support for innovative applied research relating to LCT, with the potential added value.</li><li>- Integration of LCT into training and education systems.</li></ul>
Slovenia takes a leading position in at least three LCTs and increases export of technology	
Increasing innovative activity in the LCT area	
Buildings	
Objectives	Policy Guidelines
By 2050 reduce total greenhouse gas emissions from buildings to zero.	<ul style="list-style-type: none"><li>- Introduction of energy accounting for all public buildings and accelerated energy restoration and renovation of public buildings.</li><li>- Informing the public and building owners about the benefits of energy efficiency and renewables.</li><li>- Supporting the development and implementation of low carbon building standards and systems.</li><li>- Ensuring compliance with regulations and standards, simplification of construction and spatial regulation, establishing legal basis for mandatory energy renovation of apartment blocks and appropriate regulation of energy services.</li><li>- Providing direct grants and concessional loans to investors with the risk of energy poverty.</li></ul>
By 2020, all new construction, by 2030 all public buildings, by 2050 all buildings passive or energy self-sufficient, and most of them will be energy positive or active.	
Increasing the efficiency and utilization of space through concentration of settlements and increasing the share of rental housing units.	

	- Guidelines and requirements for spatial planning at local level which will encourage efficient use of land and buildings.
Industry	
Objectives	Policy Guidelines
By 2050 reduction of total emissions from the industry to around 1 Mt CO <sub>2</sub> eq.	<ul style="list-style-type: none"><li>- Government measures to support competitiveness of industry (sufficient time frames, green tax reform, a sufficient quantity of electricity from renewables, CHP project support).</li><li>- Restructuring programs for threatened or suspended operations due to rising prices of emissions in the direction of relevant low-carbon technologies, products and services.</li><li>- Slovenia's participation in the development of EU ETS, the establishment of so called "equivalent measures" at the national level for operators of smaller installations, CO<sub>2</sub> tax exemption scheme</li><li>- Adopting "domestic flexible mechanisms".</li></ul>
Achieved a high competitiveness of Slovenian industry in the global market.	
Use all the renewable energy potentials to produce heat and electricity within the industry and on industrial sites.	
Services	
Objectives	Policy Guidelines
By 2050 reduction of total greenhouse gas emissions from service sector to zero <sup>2</sup> .	<ul style="list-style-type: none"><li>- Exploitation of suitable surfaces of public buildings, shopping and other facilities to produce renewable energy.</li><li>- Measures to improve energy efficiency in the service sector.</li><li>- In retail trade accelerated introduction of home delivery together with measures of local supply and efficient logistics.</li><li>- Development of financial services related to emission reduction and adaptation: energy performance contracting, loans, insurance, etc.</li><li>- Promotion of green innovation in services and education for sustainable development and green jobs.</li><li>- Programme of introducing environmental efficiency in the public administration.</li><li>- Development of sustainable tourism.</li><li>- Raising the capacity of companies and individuals to use technologies and information society services.</li></ul>
Most companies in the service sector actively introduce green innovations.	
Slovenia is among the leading countries in education for sustainable development and green jobs.	
High standards of environmental performance throughout the public administration.	
The restructuring of tourism to sustainable tourism by offering locally produced ecological products.	
Broad coverage of Slovenia and use of advanced ICT.	
Agriculture	
Objectives	Policy Guidelines
By 2050, reduction in total emissions (excluding fuel) from agriculture to about 1.225 Mt CO <sub>2</sub> eq.	<ul style="list-style-type: none"><li>- Incentives for the introduction of organic agriculture, including research.</li><li>- Incentives for the establishment of local supply chain.</li><li>- Ensuring the transfer of new technologies, best practices and knowledge into practice.</li><li>- Support for the optimization of production and withdrawal of livestock production from the best agricultural land.</li><li>- Support for the increase of crop output and use of best agricultural land for the production of cereals, fruits and vegetables.</li><li>- Development of a model for determining the material flow and reduction of these material flows.</li><li>- Support the wider introduction of ecological means, fertilizers and farming techniques.</li></ul>
Adaptation to climate change.	
The increase in food self sufficiency of at least 80%.	
Optimization of the structure and performance of agriculture in providing ecosystem services in sustainable or organic manner.	
Solid waste	
Objectives	Policy Guidelines
By 2050 to reduce total greenhouse gas	<ul style="list-style-type: none"><li>- Establish an effective system of governance for waste management.</li></ul>

<sup>2</sup> with the exception of emissions from traffic related to these sectors - emissions from transport in tourism, commerce, etc.



emissions from waste management to approximately 340 kt per year.	<ul style="list-style-type: none"><li>- Promote the use of waste as a by-product for further use (raw material or energy source), demotivate disposal, promote separate collection and recycling of waste.</li><li>- Establish a legal basis for taking responsibility for waste, eliminate administrative obstacles to waste processing, simplification of supervision, ensure compliance with penal provisions in relation to uneconomic waste management (sanctions).</li><li>- Ensure effective education and awareness, share examples of good practice.</li><li>- Establish an adequate system of monitoring (flow of emissions, amount of waste, waste paths/channels).</li></ul>
Landfield waste is less than 10% and do not cause greenhouse gas emissions.	
Spatial planning	
Objectives	Policy Guidelines
Spatial development that increases energy and material efficiency and reduces the demand for mobility and transport.	<ul style="list-style-type: none"><li>- Creation of new urban paradigms that promote sustainable and accessible mobility, multipurpose, and mixed-use settlements and their friendliness, a reasonable population density and planning the renovation in the existing boundaries.</li><li>- Construction of new high-speed railways and reestablishment of Ljubljana as a node of high-speed routes from all directions, provide appropriate space requirements for urban and suburban public transport.</li><li>- Focus on the development of regional centers and ensuring their local supply of goods and services.</li><li>- Analysis of spatial vulnerability by conducting and updating studies of vulnerability to different types of landscapes.</li><li>- Implementation of an interactive spatial planning by providing common sectoral guidelines for planning according to different aspects, and creating a horizontal and trans-sectoral planning.</li><li>- Technical, economic and management measures to reduce the risks of extreme weather events.</li><li>- Harmonisation of laws with the sectoral provisions and implementation at local and regional levels.</li><li>- Full implementation of compensation for the use of building land and real estate tax.</li></ul>
Polycentric development by establishing development centres at all levels and a high proportion of local supply chains and energy self-sufficiency.	
Increased competitiveness of Slovenia as a location.	
Forests, sinks, biodiversity	
Objectives	Policy Guidelines
Integration adaptation objectives into regular close to nature management of forests, including change of species, increasing resilience to natural disasters and fire safety.	<ul style="list-style-type: none"><li>- Simultaneous use of two alternative approaches: a more intensive silviculture in the commercial forests (rejuvenation and sustainable change in the structure of species, immediate response to changes, securing the protective function) and leaving ecosystems to natural processes in the network ecological cells, reserves and virgin forests.</li><li>- Improve the integrated ecosystem management in the field by networking and professional training of services (forestry, nature conservation, agriculture), local communities and landowners:</li><li>- Joint marketing of timber and management of small forests for forest owners.</li><li>- Construction and management of dry and wet retention basins and wetland restoration inside and outside the forest.</li><li>- Sustainable management of protected areas for the purpose of economic return on ecosystem services.</li></ul>
By the year 2040 increase the annual cut of timber to the level of the total annual increment and ensure the highest possible level of wood processing.	
Establishing a network of large and small areas where ecosystems are left to natural development, providing the space and time for adjustment, the requisite genetic resources and the possibility of studying natural adaptive processes.	
Water	
Objectives	Policy Guidelines

Achieving good status for all waters according to the Water Framework Directive <sup>3</sup> .	<ul style="list-style-type: none"><li>- Effective functioning of the institutions to ensure the integrity of the water regime: the assumption of responsibility for water management and thus for the implementation of water management plan (WMP), the Water Act and the Water Framework Directive, including the strengthening of water infrastructure, providing cooperation with local operators across sectors and other key stakeholders and the establishment of the intersection of professional tasks in the field of water (basic research, monitoring, control).</li><li>- Funds for research and implementation of adaptation strategies in water sector use by 2050. Detailed model-based projections of future water availability in the dynamics of Slovenia will be the basis for the necessary measures to ensure efficient use of water or program to reduce or replace water use by individual consumers or water users.</li></ul>
Implementmtnation of preventive measures to increase space for natural processes associated with water, the multiple use of water multifunctional reservoirs, implementmtnation of restoration and other preventive measures.	
Slovenia will successfully cooperate with other countries in water management in transboundary water areas.	
Health	
Objectives	Policy Guidelines
Developed system of prevention, which will increase the health and environmental awareness of people and the system, and contribute to reducing health care costs.	<ul style="list-style-type: none"><li>- Research and development needed to improve monitoring of health and environmental parameters and assessment of environmental impacts on human health.</li><li>- Integration of health objectives into all policies and greater intersectoral collaboration.</li><li>- Designing a coherent national strategy for the operation of the representatives of Slovenia in international fora and the implementation of commitments already made to help developing countries.</li><li>- Monitoring, control and publication of records or data on occupational and environmental diseases, including regular coordination, continuation of the existing monitoring and greater transparency and accessibility of data.</li></ul>
Adaptation of the health system to effects of climate change.	
Natural disasters	
Objectives	Policy Guidelines
Improving the prevention from effects of disasters and weather events.	<ul style="list-style-type: none"><li>- Improving preventive measures; greater coherence and coordination between these approaches and the competent authorities to avoid duplication; joint planning of activities and coordinated support to the decision-making level.</li><li>- Improving projections of the effects of climate change on type, likelihood and intensity of accidents in the future. Based on these projections, the assessment of vulnerability to certain areas and sectors.</li><li>- Provide state funds for investment and maintenance of public functions.</li><li>- Assumption of responsibility by individuals, businesses, local communities and civil society.</li><li>- Good cooperation and coordinated approach in the EU's efforts and broader international cooperation.</li></ul>
Provision of adequate number and readiness of forces for protection, rescue and assistance (civil protection and disaster relief) and strengthening of personal and mutual protection of the population.	

<sup>3</sup> "Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy", 23 October 2000.